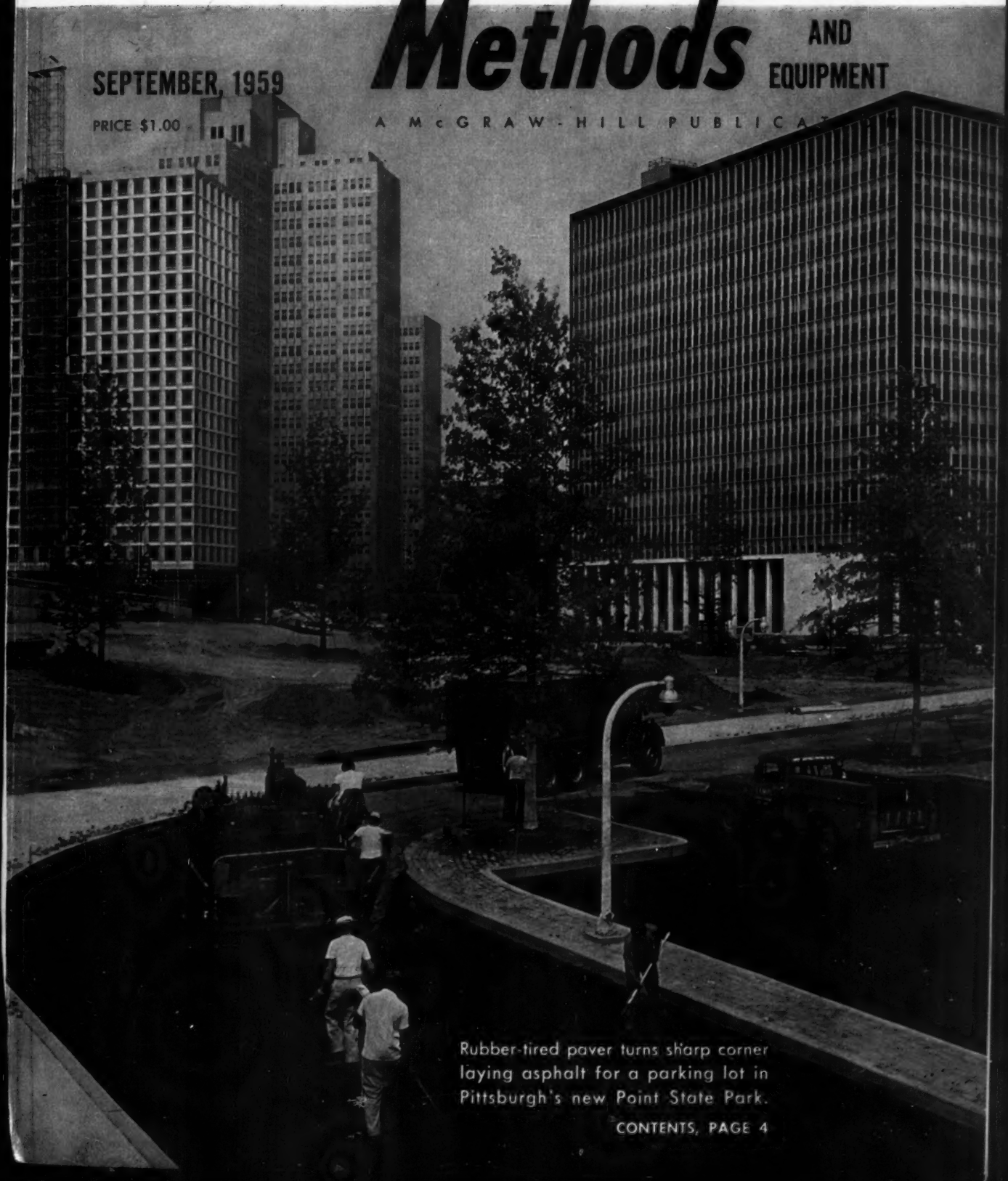
Construction Methods AND EQUIPMENT

SEPTEMBER, 1959

PRICE $1.00

A McGRAW-HILL PUBLICA



Rubber-tired paver turns sharp corner laying asphalt for a parking lot in Pittsburgh's new Point State Park.

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"5-6 times longer rope life drilling 1560 holes"

John Holman, Mgr.
Contractors Foundation Drilling Co.
Fort Worth, Texas

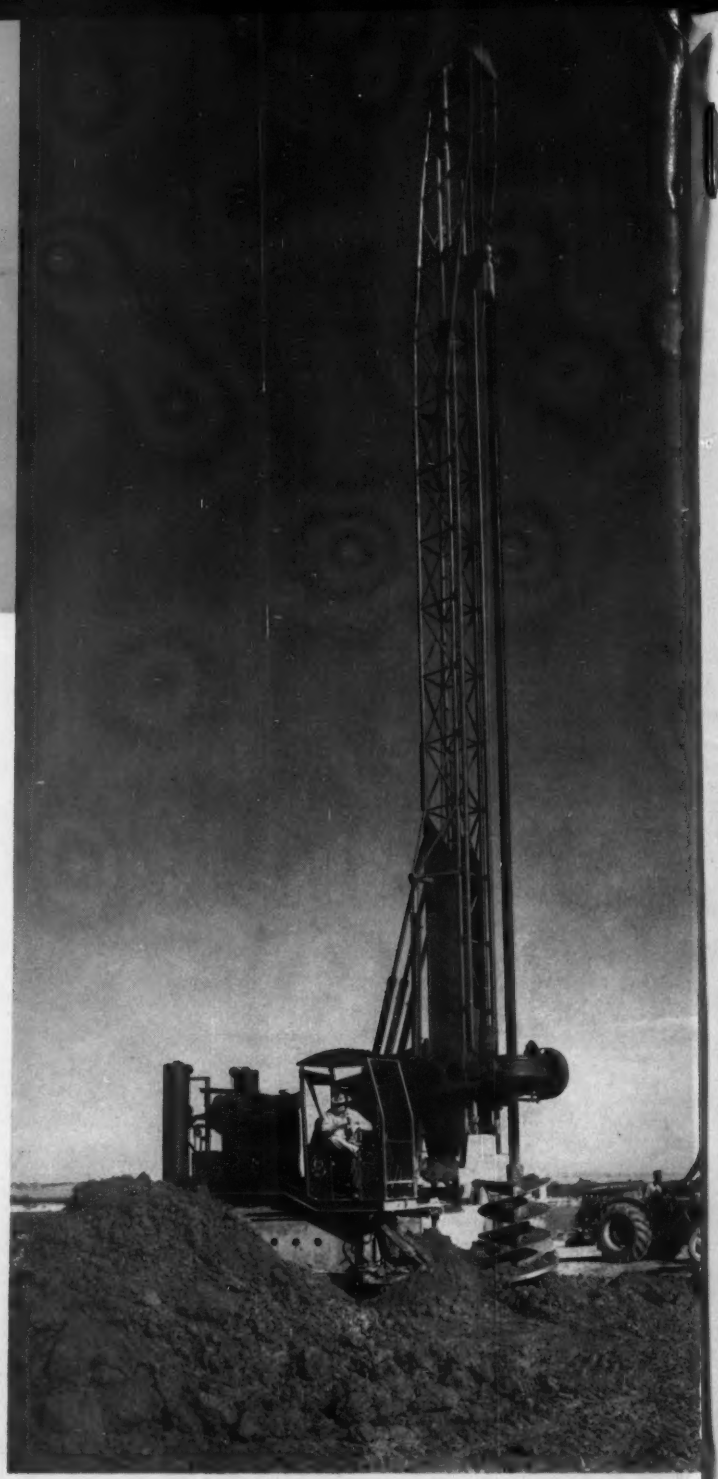
Holes drilled per line of ordinary rope: *8 to 10.* Holes drilled per line of Yellow Strand "POWERSTEEL": *50!* This job is tough on wire rope — but high-strength, longer wearing "POWERSTEEL" is especially made for jobs like this. Let Manager John Holman tell the story in his own words:

"Our contract with Tarrant County Water Control District No. 1 required drilling 1,560 holes, each 45" in diameter and 33' deep, backfilling with clay and compacting to provide a continuous impervious wall. The contract further provided for completion in 180 calendar days.

"Our method of operation required a machine to drill the hole, backfill and compact. Unusual wear and fatigue caused excessive breaking of various brands of wire rope, often requiring two to three 225' rope changes per day. With ½" 6 x 25 'POWERSTEEL' we reduced rope breakage to one 225' length approximately every 30 days.

"We realized substantial savings in rope cost, man-hours and down time, all of which were instrumental in completing our contract approximately 45 days ahead of schedule."

Contact your nearest Broderick & Bascom Distributor for "POWERSTEEL" help on your tough jobs. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.



Yellow Strand®

"POWERSTEEL".®

WIRE ROPE

SLINGS

CLIPS

B.F.Goodrich

B.F.Goodrich tires handle the tough jobs at mammoth Niagara Power Project

UNDER construction at Niagara Falls, N.Y., are the powerhouse, waterways, reservoir and intake—all part of the gigantic $720-million Niagara Power Project. Shown above: site of 110′ x 50′ excavation for one of the twin, 46′-wide, covered intake conduits. On the job: a fleet of trucks equipped with B.F.Goodrich tires and owned by Merritt-Chapman & Scott Corporation, largest contractor on the project.

These trucks haul ton after ton of rock and overburden from the excavation to the spoils area, work round-the-clock, 6 days a week, under severe operating conditions. In spite of this, B.F.Goodrich Rock Service tires are still going strong after 3,135 hours of service!

The Rock Service tread is specially-compounded to resist rock cuts and snags. Massive double-chevron cleats give extra traction in forward or reverse. Thanks to the special B.F.Goodrich FLEX-RITE NYLON cord body, Rock Service tires are virtually immune to heat blowouts and flex breaks. Result: you get longer tire life—more retreadable tires!

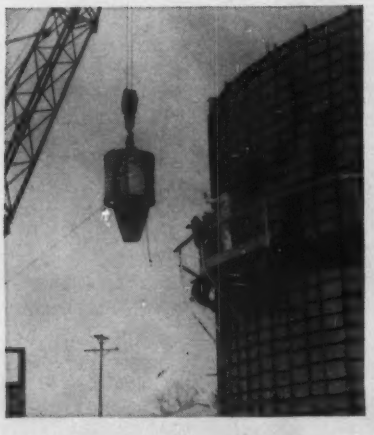
Other B.F.Goodrich products at work on the Niagara Power Project are conveyor belting, air hose, protective clothing and footwear. Maintenance and service programs for tires and industrial products are also in operation—all part of the new B.F.Goodrich Unified Contractor Program. No matter what your off-the-road job, B.F.Goodrich is ready to serve you—and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

Smileage!

B.F.Goodrich *off-the-road tires*

16 Working Days

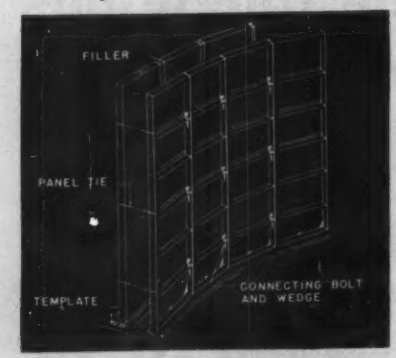


Experienced Men and Symons Forms

. . . Pour Sewage Treatment Plant in Record Time

One of the speediest sewage treatment plant projects ever undertaken in the Southwest was completed in 16 working days near Phoenix, Arizona. Capacity of plant is rated at 5 mgd. It has a 700,000 gallon digester.

F. H. Antrim Construction Company used 15,500 square feet of Symons Steel-Ply panels. An important factor in selecting Symons Forms was that they could be erected on one side of the circular tanks without installing ties immediately.



Forms were contracted for on a rental basis with an option to purchase. Later, Antrim decided that the forms were so well adapted to his work that he purchased 14,000 square feet of the panels.

Folder giving the complete Antrim story sent FREE upon request.

Symons

SYMONS CLAMP & MFG. CO.
4255 Diversey Ave., Dept. J-9, Chicago 39, Ill.

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SEPTEMBER, 1959

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You'll find that Whyte Strand, made of sturdy improved plow steel, wears well, bends well, and has the "guts" to withstand plenty of punishment. You won't have to coax it along to get good service: The mileage and wearing life are built into the proven design!

Give Whyte Strand ropes a real trial—you'll get the kind of service that will make you want to put Whyte Strand on all your equipment!

175

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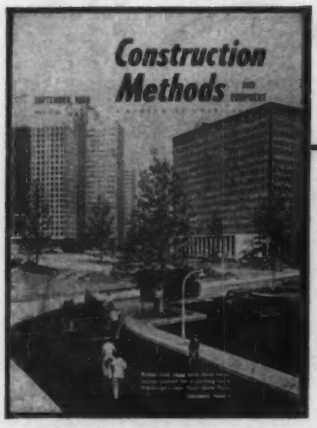
Manufacturers of Wire Rope, Slings and Cable Assemblies
Distributed and Stocked Throughout the United States

For Shovel-Hoist Rope, Dragline, Clamshell-Crane Rope, Boom-Hoist Line, Dozer Rope, Scraper Rope, Contractor's Hoist and Derrick Rope, and Winch Line



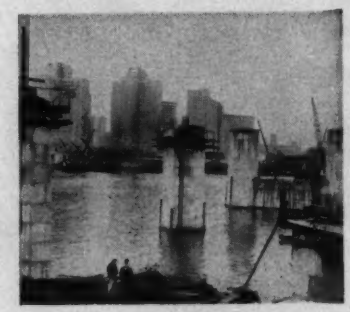
ON THE COVER

A Blaw-Knox rubber-tired bituminous paver-finisher places asphalt for a 95-car parking lot in Pittsburgh's new Point State Park. Machine had no trouble working around high curbs and in tight corners. Lampl Asphalt Paving Co. of Dravosburg, Pa., handled the paving work for J. H. McQuade & Sons Construction Co. of Pittsburgh.

Pay Dirt in This Issue

Timber Frames Hold Granite Forms for Piers. 96

The carpenter crew on this bridge job built an adjustable bracing frame that holds the granite slabs facing the tapering piers and makes them function as concrete forms.

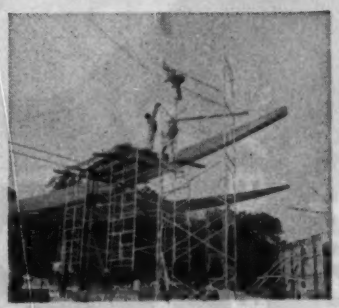


Airfield Job Features Prestressed Pavement. . 110

The contractor at Biggs AFB has just laid a sizable section of prestressed pavement for the first time in the U.S. It's a significant new development in paving.

Concrete Roof Needs No Forms. 153

An Atlanta contractor sprays concrete over reinforcing and lath draped between long cantilevered girders to form a canopy independent of the building underneath.



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NEXT MONTH

A New England contractor describes the techniques that go into the casting and assembly of single T prestressed concrete girders for a long-span, multi-storied parking garage in Springfield, Mass. It's still an experimental method, but it may produce savings of almost 50% over poured-in-place concrete construction.

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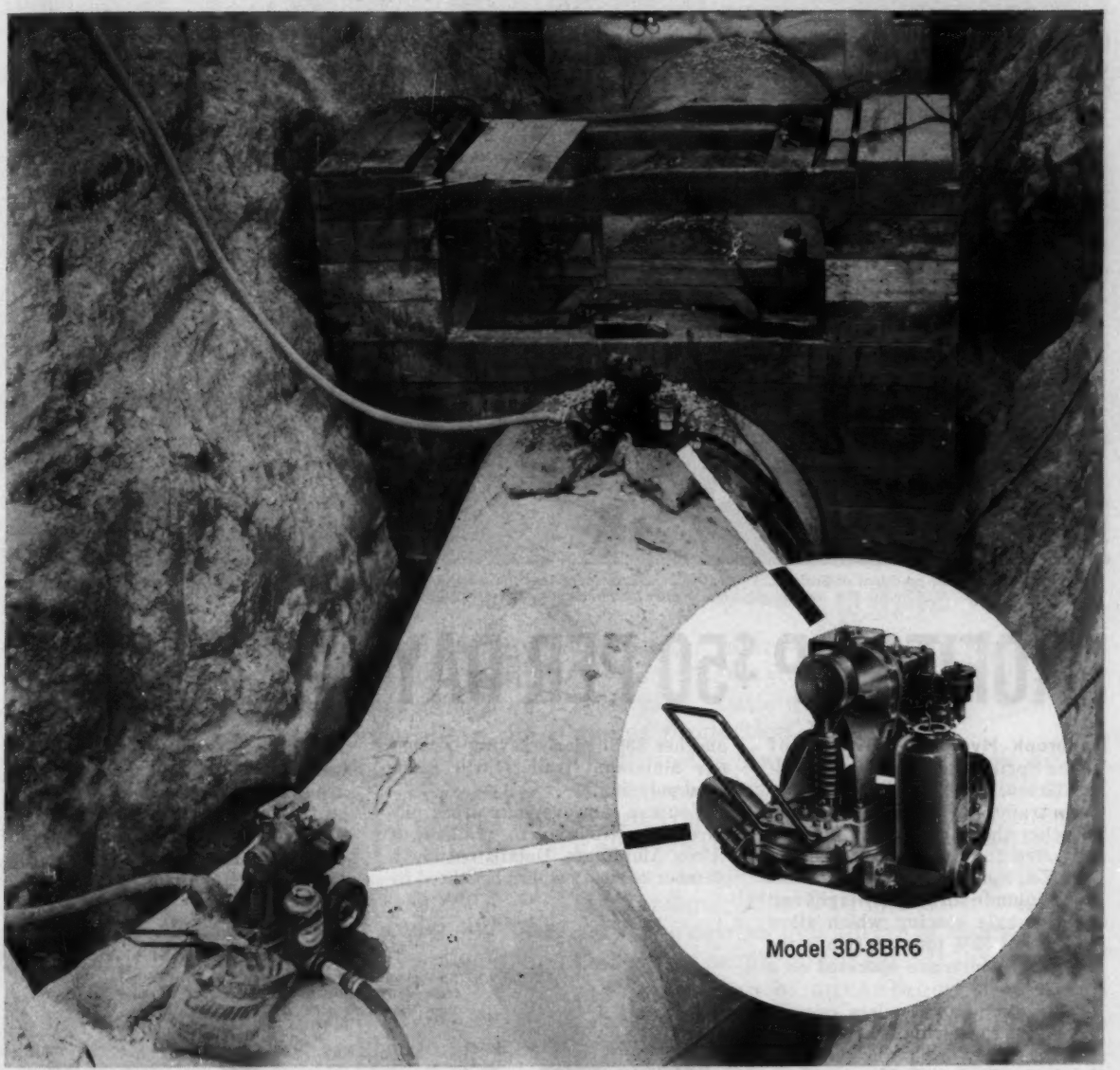
57 DIAPHRAGM PUMPS ON THIS JOB...AND 47 ARE GORMAN-RUPP



The Brea (California) pipeline job consists of 14 miles of 96" cement-coated steel pipe. Diaphragm pumps were selected because they can be easily moved from bell joint to bell joint as the welders progress. Contractors: Morrison-Knudsen, Inc. and Macco Corp. of Los Angeles.

Gorman-Rupp Diaphragm pumps are by far the favorite of contractors. These exclusive features show why: diaphragm drive rod spring-cushioned on down-stroke; suction accumulator for smooth pumping flow; antifriction, helical-ground gears and bearings operate in oil; one-man handling, engine-driven 3" pump only 120 lbs., job-to-job.

Isn't it time *you* tried a Gorman-Rupp Diaphragm Pump?

THE GORMAN-RUPP COMPANY

305 BOWMAN STREET • MANSFIELD, OHIO

Mr. Vernon J. Verplank, president of Spring Lake Coal & Dock Co., supervises the weighing of his dump body train of Alcoa Aluminum. The lightweight units haul a combined payload of 42½ tons per trip.

PROFITS UP $50 PER DAY WITH DUMP TRAIN OF ALCOA ALUMINUM

Daybrook Hydraulic Division of Young Spring and Wire Corp., Bowling Green, Ohio, built these two dump trailers of Alcoa® Aluminum. Together they are earning $50 per day *extra* for Spring Lake Coal & Dock Co., Spring Lake, Mich. Credit goes to aluminum's light weight and effective axle spacing which allow payloads of 42½ tons per trip in the two units which are operated as a train.

"Our aluminum trailers operate around the clock hauling coal, gravel and limestone," says Mr. Vernon J. Verplank, Spring Lake president. "We count on the units making five 70-mile trips a day, and we estimate extra profits at $10 per trip. In addition to their big extra payload capacity, we like their strength. Since we switched to aluminum, we're no longer bothered by trailer bodies 'ripping' due to highway vibration while hauling coal. They've been in service a year now and show no signs of wear. We also estimate another $300 yearly saving because our aluminum trailers will never need painting."

You can improve your profit picture by switching to trailers of Alcoa Aluminum. Details on how a number of fleet owners benefited by switching to this strong, lightweight and maintenance-free metal are available in a case-history booklet that is yours for the asking. For your copy, write today to Aluminum Company of America, 1774-J Alcoa Building, Pittsburgh 19, Pa.

Spring Lake's trailer train makes five round trips daily, hauls 23 more tons of payload than the single steel unit formerly used.

ALCOA ALUMINUM

Your Guide to the Best in Aluminum Value

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

VISIT ALCOA'S DYNAMIC EXHIBIT at the Sherman Hotel, Chicago, during TBEA's 12th Annual Convention, October 5-7. You'll see actual demonstrations of the latest techniques employed in welding aluminum alloys for dump body fabrication and damage repair—and the industry's most experienced experts will answer your questions—at Alcoa's booth in spaces 73 and 74.

"WE'VE GOT TO GET IT DONE!"

On visits to jobs to get the real story of Northwests at work we often find many machines. It is no accident that almost invariably a Northwest is pioneering in the heaviest digging—the rock digging! "Why", we ask, "do you choose the Northwest for the rock work?" Always, the answer is the same, "We've got to get it done!"

Watch a Northwest Shovel at work in rock! The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. The swing is smooth. The load is spotted in one clean move. It's in the truck and the dipper is back in the bank.

Hour after hour—day after day—yard after yard, that's what makes production. Your Northwest is always ready to go. *We hear it everywhere and Northwest users will tell you so.* The "Feather-Touch" Clutch Control makes operation easy without resorting to pumps, compressors and other delicate mechanisms. The Cushion Clutch eliminates the detrimental effects of shock loads and makes ample power safe. It brings you a combination of advantages that has proved its ability to get high output in rock and make easy digging easier. It gets things done!

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NORTHWEST *Always Ready to* **GO**

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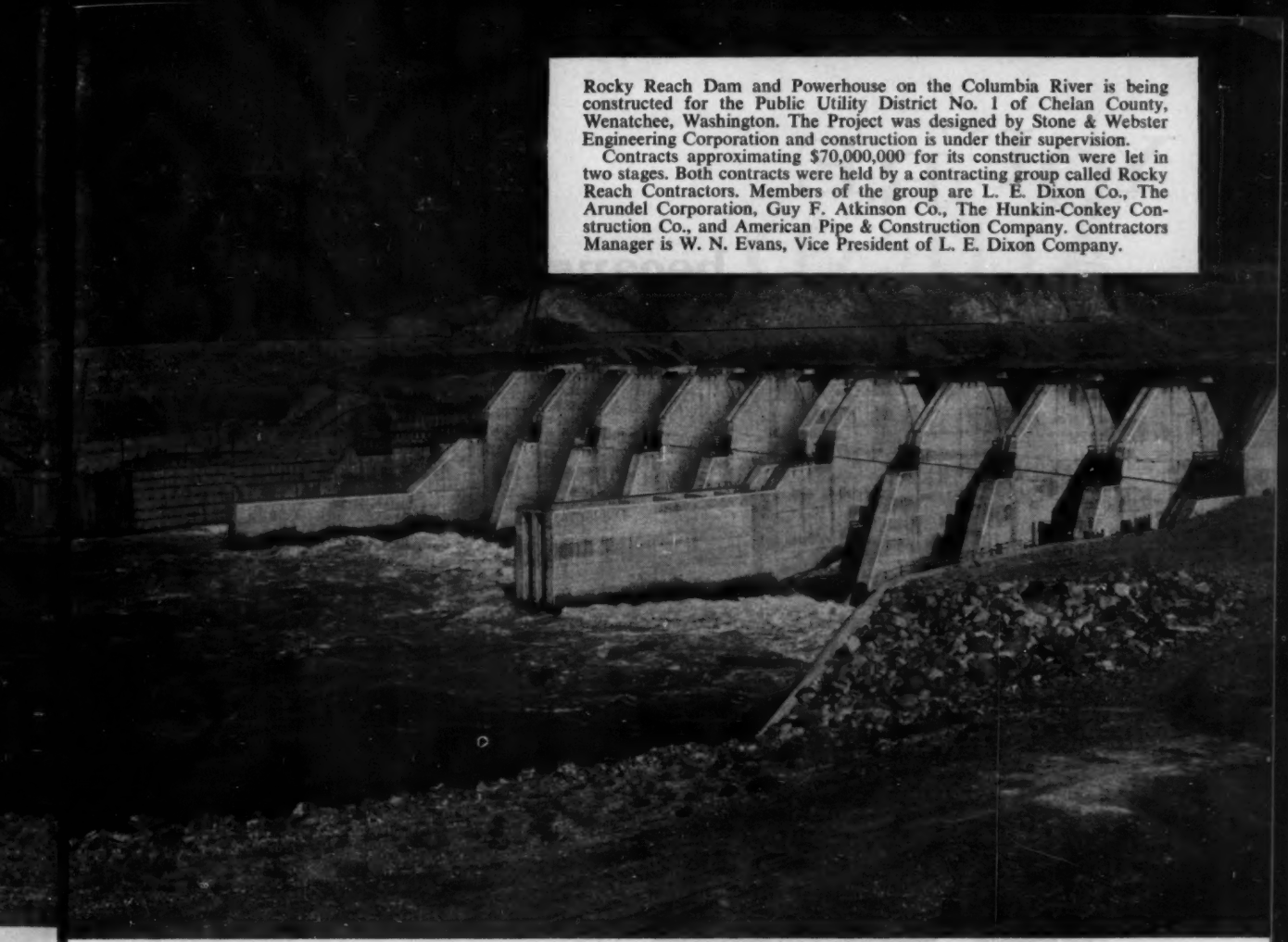
NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
⅜ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	⅜ Yd. to 3 Yd. Capacity	⅜ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

Texaco Simplified Lubrication Plan Keeps

W. N. EVANS (left), Contractors Manager for Rocky Reach Contractors, points out that the general high production rate on the job can be attributed to extended machine life and decreased downtime. He specified Texaco lubricants after thorough experience with these products in previous major Western dam projects. E. S. Saunders, Texaco Contractor Sales Representative, helped him choose the six basic lubricants required for all equipment on the job.



Rocky Reach Dam and Powerhouse on the Columbia River is being constructed for the Public Utility District No. 1 of Chelan County, Wenatchee, Washington. The Project was designed by Stone & Webster Engineering Corporation and construction is under their supervision.

Contracts approximating $70,000,000 for its construction were let in two stages. Both contracts were held by a contracting group called Rocky Reach Contractors. Members of the group are L. E. Dixon Co., The Arundel Corporation, Guy F. Atkinson Co., The Hunkin-Conkey Construction Co., and American Pipe & Construction Company. Contractors Manager is W. N. Evans, Vice President of L. E. Dixon Company.

Rocky Reach Construction on Schedule

Only six lubricants are needed to handle all major requirements on the Rocky Reach Dam project. That's how the Texaco Simplified Lubrication Plan keeps inventory down, cuts handling and storage costs, helps maintenance personnel sidestep the dangers of misapplication. Here's what Contractors Manager W. N. Evans has to say about it:

"The high production we've been getting from our equipment at Rocky Reach Dam is due in large measure to the help we've had from Texaco. The Texaco Lubrication Plan—and the service that goes with it—really help keep our equipment on the job. We've had little downtime and we're getting longer machine life."

Mr. Evans and the local Texaco Lubrication Engineer chose the six basic Texaco lubricants to meet the requirements of the project after a complete lubrication survey of all equipment. Their selections: 1) *Texaco Ursa Oil Super Duty* for all super-charged engines; 2) *Texaco Ursa Oil Heavy Duty* for all other diesel and gasoline engines and air compressors; 3) *Texaco Rock Drill Lubricant EP;* 4) *Texaco Marfak Multi-Purpose 2* for all grease applications; 5) *Texaco Track Roll Lubricant;* and 6) *Texaco Crater Fluids* for open gears and wire rope.

Your Texaco Lubrication Engineer can show you how much the Texaco Simplified Lubrication Plan has saved other contractors—how it can help you. Call the nearest of the more than 2,300 Texaco Distributing Plants, or write Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

YOU'RE AHEAD because the specialized in front-end

result of 14 years' leadership

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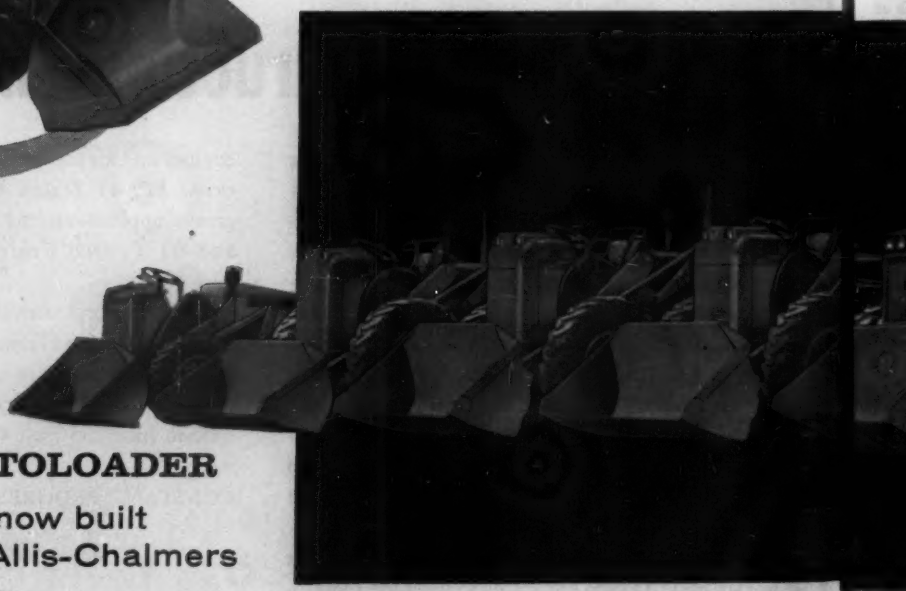
pioneer of the world's first successful hydraulically controlled, crawler-mounted tractor shovel.

result of 11 years' leadership

TRACTOMOTIVE

one of the first to develop heavy-duty rubber-tired loaders.



YOU'RE AHEAD with a TRACTOLOADER

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Seven models—34 to 130 hp—
up to 9,000-lb carry capacity.
Torque converter drive in every model.

move ahead with

experience of two pioneer companies loaders is now combined . . .

Now Tractomotive Corporation has become part of Allis-Chalmers . . .

and that means we'll be able to serve you better than ever. One very important reason is that the specialized experience of each organization in its field cannot be surpassed.

Allis-Chalmers pioneered its history-making HD-5G in 1945 . . . has led the field in crawler shovel design and performance ever since . . . now offers the most complete line of such equipment in the industry, with bucket sizes from 1½ to 7¼-cu yd.

The Tractomotive team has been building heavy-duty wheel loaders since 1948 . . . has consistently pioneered developments of great value to users, including torque converter drive and single-lever shifting control.

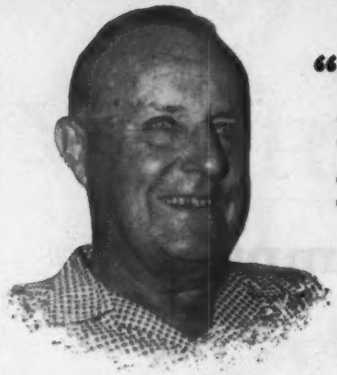
Through the combined facilities of these two pioneers, we offer you industry's most complete line of front-end loaders, on rubber or tracks . . . with these added basic advantages to back it up!

- another modern plant joins Allis-Chalmers' extensive facilities for manufacturing construction machinery
- a company-wide record of engineering leadership in all types of heavy-duty equipment
- widespread research activity that insures continuing progress
- original factory parts and blue-chip parts control
- increased man power in sales and service

See 'em at work—your Allis-Chalmers dealer will be glad to demonstrate the machine of your choice —wheel or track-mounted, whichever meets your job needs best. Just give him a call. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

. . . power for a growing world



"Our improved control with POZZOLITH cuts costs on the Eglin Air Force Base job"

W. J. NOONAN, SR.,
President, Noonan Construction Co.,
Pensacola, Florida

DRY-BATCH PLANT located on the Gulf—approximately 9 miles from the job site. Most aggregates were delivered by barge from Radcliffe Gravel Co., Inc. of Mobile Alabama. Ideal Cement was also transported to the batch plant by this method.

THIS CONTRACT at Eglin Air Force Base involved the placing of 110,000 cubic yards of unreinforced concrete. Pavement ranged from 14" to 22" thickness. Supervising the job is W. J. Noonan, Jr., General Manager, Noonan Construction Co. • Curtis Sullens, Concrete Supervisor, Corps of Engineers, Mobile District • John Day, Project Superintendent, Noonan Construction Co.

"Corps of Engineer specifications called for 650 psi flexural strength with 4½% ±1½% entrained air. We knew that with local materials and good control, a plain mix with a cement factor of about 6 sacks per cubic yard should produce this strength.

"We also knew that with POZZOLITH we could meet this flexural specification with 5 to 5.2 sacks and that POZZOLITH would provide close control of entrained air, as well as lower finishing costs. So we based our bid on using POZZOLITH.

"The job was started with a POZZOLITH mix having a cement factor of 5.8 sacks. Because of uniform strength results, well above specification, it was gradually reduced to the 5.2 sack factor which we used in our original estimates. The uniformity in batches, absence of bleeding, and exceptionally good workability kept finishing costs down. Air content was easily maintained at 3½% with minor adjustments being made quickly in the field.

"The Master Builders field man worked with us from start to finish giving us the benefit of his experience. This resulted in better quality concrete at lower cost to the owner and substantial savings to us."

For lowest cost-in-place . . . superior quality concrete—there's no equal to today's POZZOLITH. Call in the local Master Builders man to demonstrate how POZZOLITH can help put you ahead on your very next job.

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Division of American-Marietta Company
The Master Builders Company, Ltd., Toronto 15, Ontario
International Department, New York 17, New York
Branch Offices in all principal cities.

MASTER BUILDERS® POZZOLITH*

**POZZOLITH is a registered trademark of The Master Builders Co. for its concrete admixture to reduce water and control entrainment of air and rate of hardening.*

Construction News From Washington

Washington, D.C.
September, 1959

Interstate Highway

The long debate in Congress about how to finance construction of the Interstate Highway System put a damper on highway contract awards this summer. The Bureau of Public Roads estimates the value of all Federal aid projects let to contract by the states during July at $234 million—down $198 million from the previous month.

Most of the drop was in contract awards for interstate projects. Awards fell off from $230 million in June to only $97 million in July. For Federal aid work on the primary and secondary systems and their urban extensions, the value of contracts awarded declined to $137 million from a June figure of $202 million.

During the first week in August, contractors got only $22.4 million of new highway construction contracts. That's the lowest weekly volume since November, 1957.

Showdown in 1961

The final decision on how to pay for interstate roads will be made in 1961 when Congress must write a new long-range highway financing plan. At that time the Bureau of Public Roads will have completed a comprehensive report on the first years of the interstate highway building program.

The sharp differences of opinion in this session on ways to bolster the depleted Highway Trust Fund make it almost certain that 1961 will bring another hot controversy. The plain fact is that a lot of Congressmen simply don't like the idea of slapping a new tax on highway users whenever more money is needed to keep highway construction on schedule. These Congressmen insist that the national defense value and other national benefits of a first class highway system should be paid for out of general revenue—not entirely out of the pockets of highway users.

Military Construction

Congress voted the Army, Navy, and Air Force enough money to award construction contracts for $1.2 billion of newly authorized projects. About 80% of this money will be spent on construction in the continental U.S.

The Air Force gets more than half—56%—of the total. The Army gets only 19%; the Navy 16%. The remainder is for Defense Department research projects, construction for reserve units etc.

Nearly half of the total, will go for construction of missile facilities. The Air Force will spend $413 million and the Army nearly $120 million on missile installations. All of this construction will be in

the U.S. except for $84 million allotted to Army Nike installations overseas.

In addition to the money appropriated for defense construction by this Congress, the armed services have an unspent total of $880 million carried over from last year. This gives them ample funds to finance the $1.7 billion of new construction they have budgeted for the 12 months ending next June.

Battle Over Construction

There's a chance it will take a special session of Congress later this year to put through some legislation important to the construction industry.

The housing bill may be an example. The President has vetoed two housing bills in this session of Congress because they would raise the level of federal spending for housing well above his budget. Both bills would have authorized 37,000 new public housing units and loan programs the President does not want.

But some sort of a housing bill is necessary. Among other things, it's needed to extend the Federal Housing Administration's mortgage insurance authority.

If Congress should adjourn without approving at least a simple extension of this FHA mortgage insurance authority, the President might call Congress back in a special session to get this legislation. In a special session, the advantages would be with the President. He could put the pressure on Congress to give him the legislation he needs.

How Many New Starts?

The President also is determined to stick to his "no new starts" policy for public works construction. And this is a bitter pill for Congress to swallow.

The $1.2-billion appropriation bill Congress passed and the President vetoed calls for about 70 new construction starts. It includes all types of construction projects—flood control, conservation, post offices, dams, and waterways—in every state of the union.

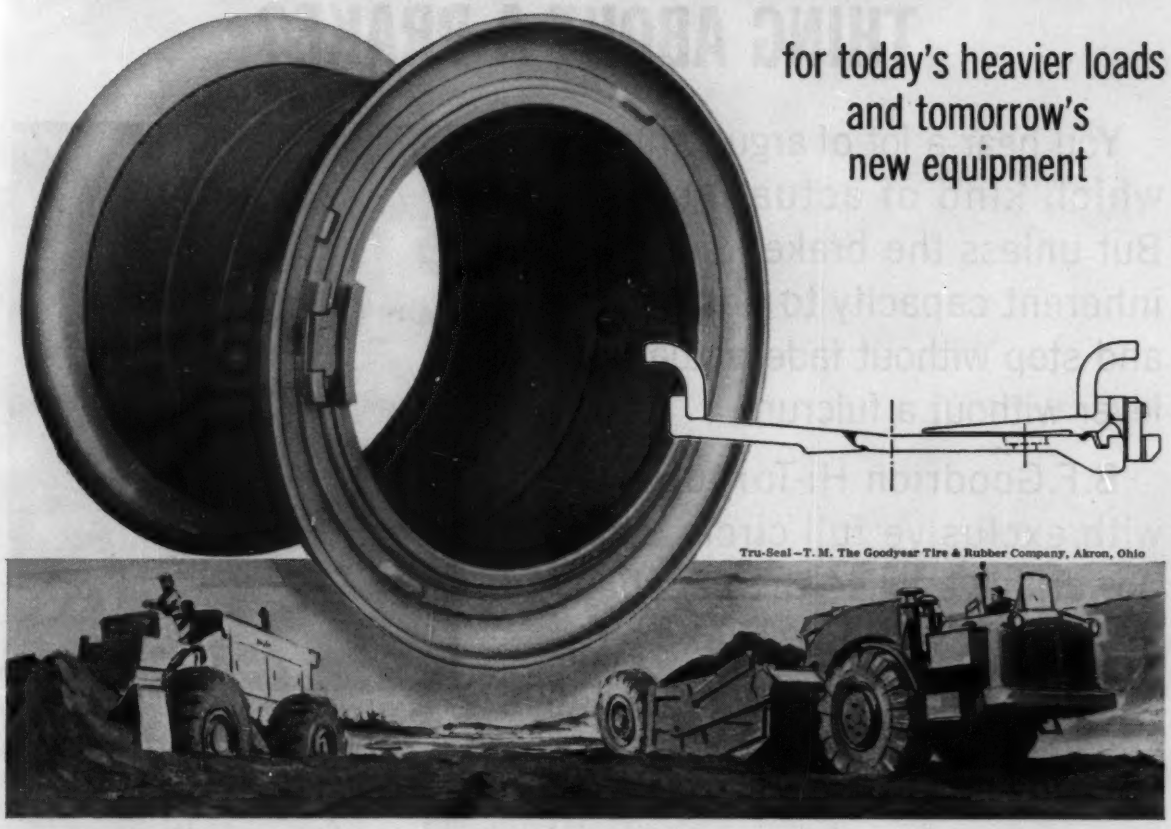
President Eisenhower said the inclusion of so many new starts would "ignore the necessity for orderly development of America's water resources within the nation's fiscal ability." It would appropriate about $50 million in this fiscal year for new starts. In addition to the new starts, the bill calls for more than $1 billion to continue work on projects already under construction. That's an all-time high in itself.

Some of the major new starts are Beaver Reservoir in Arkansas, New Hogan Reservoir in California, Pound Reservoir in Virginia, Summerville Reservoir in West Virginia, the Ohio Street Bridge in Buffalo, N.Y., Pascagoula Harbor in Mississippi, and the Jacksonville-Miami Waterway in Florida.

Introducing

The New Earth-Mover Rim

for today's heavier loads and tomorrow's new equipment



Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

To meet the increased tonnages and the higher speeds of today's and tomorrow's earth-moving equipment, Goodyear presents a whole new line of heavier, stronger rims.

The new Earth-Mover Rim offers these standout advantages in every size from the smallest to the largest:

Extra thickness and weight to withstand greater horsepower, greater tire pressure and heavier loads. Down time reduced to a minimum.

Heavy-duty bead seat band driver—to prevent slipping.

Sealing ring—Goodyear's famous Tru-Seal principle provides positive air seal.

The Goodyear Earth-Mover Rim is now available in 29-inch and 33-inch diameters. These fine job-fitted rims are your best insurance against premature tire and rim failure.

Next time you need rims, why not benefit by Goodyear's incomparable experience in building rims of every kind and size for all types of vehicles. See your local distributor, or write:

Goodyear, Metal Products Division, Akron 16, Ohio.

Your tires go farther on RIMS by

GOODYEAR

MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

B.F.Goodrich

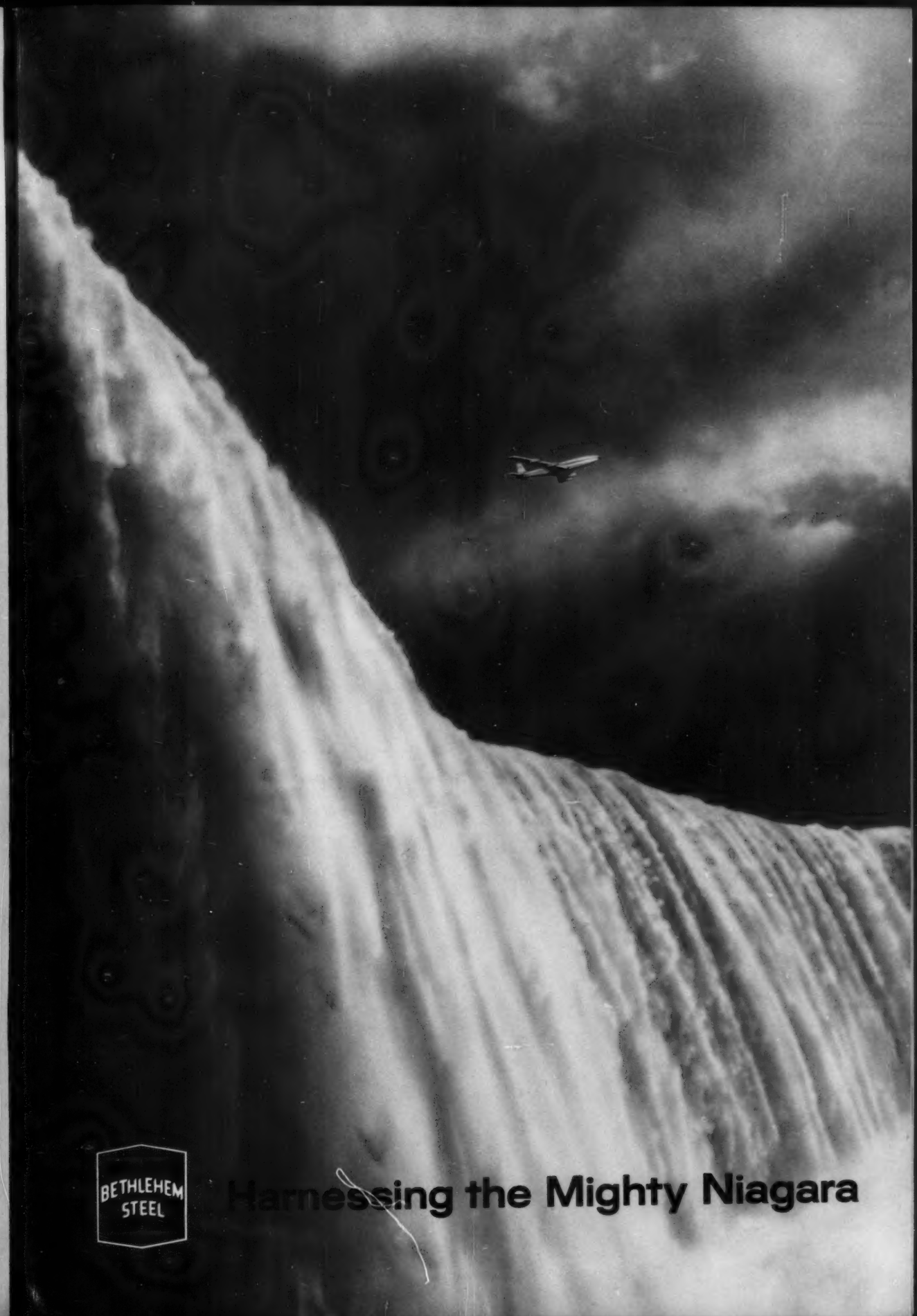
WHAT'S THE MOST IMPORTANT THING ABOUT A BRAKE?

You hear a lot of arguments about which kind of actuation is best! But unless the brake itself has the inherent capacity to absorb energy and stop without fade, actuation is a lever without a fulcrum.

B.F.Goodrich Hi-Torque Brakes, with exclusive full circle stopping power, have twice the capability of ordinary two-shoe brakes — stop twice as fast under actual operating conditions. More uniform lining pressure keeps brake drum heat to a minimum—reduces the chance of fade on those long, steep grades. And Hi-Torque Brakes perform equally well whether the actuation is air or direct hydraulic. Both systems are available only with B.F.Goodrich Hi-Torque Brakes.

Specify the one brake designed with reserve power to give you faster cycle times, greater safety. B.F.Goodrich Hi-Torque Brakes are available in sizes from 17¼" x 4" to 26" x 7". They need no lubrication, adjust themselves automatically. Contact your equipment supplier or B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Dept. CM-99, Troy, Ohio.

B.F.Goodrich ***Hi-Torque brakes***


BETHLEHEM
STEEL
Harnessing the Mighty Niagara

Twin conduits will shoot Niagara's water to 1,950,000-kw power house below Falls

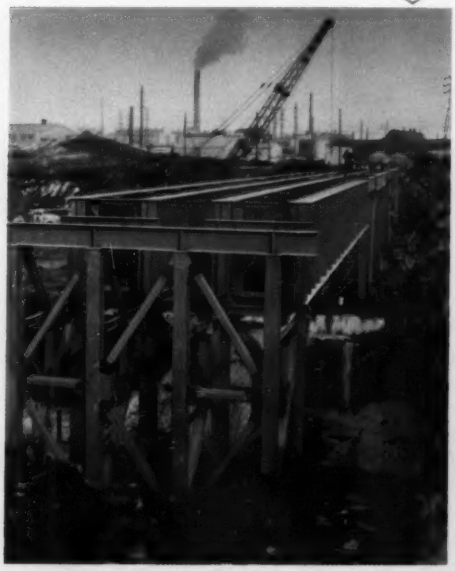
BETHLEHEM STEEL

One of the world's most ambitious power projects—harnessing the maximum potential of the American share of the Niagara River—is now underway in the Niagara Falls area. Known as the Niagara Power Project, it is being built under the direction of the Power Authority of the State of New York.

These Bethlehem H-Piles, being driven to bedrock, will provide firm support for highway interchange near new American Rapids Bridge to Goat Island.

Plenty of muscle needed at this location. Bethlehem Wire Rope swings steel bridge section into position in vicinity of Tuscarora Pump-Generating Plant.

This steelwork is for temporary highway bridge near intake structures. Bethlehem also fabricated and erected six additional bridges for project.



Features of the Project

At the intake structures above the Falls, water will be diverted from the river. It will flow four miles through two 46 ft x 66 ft underground conduits and then through a mile-long open canal to a 1,950,000-kw power plant located several miles below the Falls.

At night, during off-peak hours, some of the power of the main power plant will be used at the pump-generating plant to pump excess water up 80 ft into a storage reservoir. There it will be held in readiness for use in periods of high daytime demand when, besides producing another 240,000 kw at the pump-generating plant, the stored water will flow down the canal to the main plant to produce even more power.

The main features of the gigantic construction project are: intake structures (see circle 1 on map) and Niagara Generating Plant (3), Merritt-Chapman & Scott Corp.; water conduits (2) Balf-Savin-Winkelman and Gull-De-Felice; Tuscarora Reservoir (4), aggregate plant and canal, Channel Constructors (Peter Kiewit, Morrison-Knudsen, Perini, Walsh); Tuscarora Pump-Generating Plant (5), Tuscarora Contractors (Arundel, Hunkin-Conkey, L. E. Dixon). Related phases include a scenic highway, the elimination of railroad grade crossings, a new International Bridge to Canada, and a new bridge to Goat Island which is being fabricated and erected by Bethlehem.

What effect will this activity have on the scenic grandeur of Niagara Falls? None at all to the casual observer. In daylight hours during the tourist season, 100,000 cfs must flow over the Falls, as stipulated in the Treaty of 1950 between the U. S. and Canada. At night, and also during the daytime in the tourist off-season, the flow may be reduced to 50,000 cfs.

Wagon drills, equipped with Bethlehem Hollow Drill Steel, bore blast holes in rock during construction of 4-mile ditch to hold the reinforced-concrete twin conduits.

Bethlehem Beam Guard Rail, mounted on steel posts, offers protection to motorists at site of new power plant, overlooking Niagara River.

This Bethlehem Crane Rail is in service in temporary high-level trestle, hundreds of feet above the Niagara River at Lewiston. Trestle also contains Bethlehem structural shapes.

BETHLEHEM STEEL

LARGEST REINFORCING BAR ORDER IN BETHLEHEM'S HISTORY—Typical scene showing installation of Bethlehem Reinforcing Bars along route of 4-mile conduits. Some 60,000 tons of bars are being furnished for the project. Bethlehem also is furnishing the gate wheels, axles, and sheave wheels for the gates and gate-hoist mechanism.

A COMPLETE LINE OF CONSTRUCTION STEEL

Structural Steel . . . full range of standard and wide-flange shapes

Construction Fasteners . . .

Standard Types—Bolts, Rivets, Nails, Spikes, Clevises, Turnbuckles, Timber Hardware, High-Strength Bolts

Specialty Types—Tie Rods, Anchor Bolts, U-Bolts, Special Fasteners

Wire Rope and Strand . . . for all construction uses . . . Stress-relieved Strand for prestressed concrete

Fabricated Steel . . . Bethlehem fabricates and erects steelwork for all structures

Highway Steels . . . Beam guard rail, bar mats, dowel joints, bridge rail, and many other highway specialties

Storage Tanks . . . every type of tank for water or fuel storage

Steel Piling . . . wide range of sheet and H-piling, and accessories

Open-Web Joists . . . Complete series of shortspan and longspan types

Bethlehem Slabform . . . formed sheets for poured concrete floors and roofs

Concrete Reinforcing Bars . . . All sizes, with excellent bending and bonding qualities . . . rolled from new-billet steel

Steel Pipe . . . Butt-Weld, Electric-Resistance Weld, and Electric Fusion-Weld in a full range of diameters

Galvanized Steel Sheets . . . for ductwork, roofing and siding, drainage pipe

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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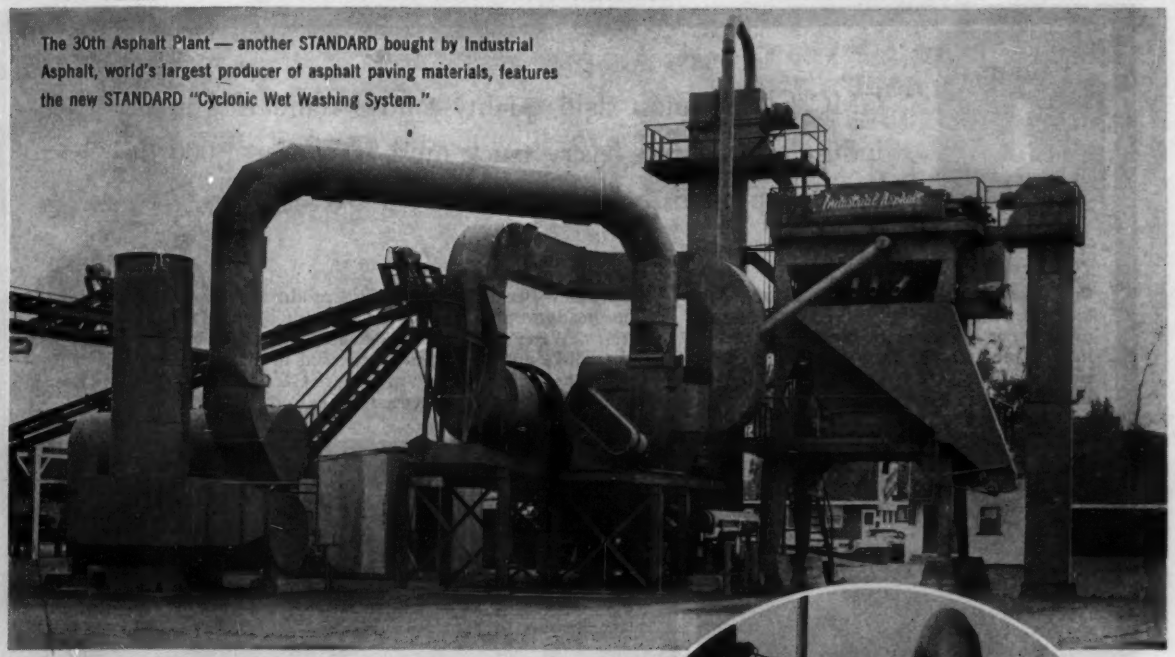
598, Printed in U.S.A.

CLEAN!



The 30th Asphalt Plant — another STANDARD bought by Industrial Asphalt, world's largest producer of asphalt paving materials, features the new STANDARD "Cyclonic Wet Washing System."

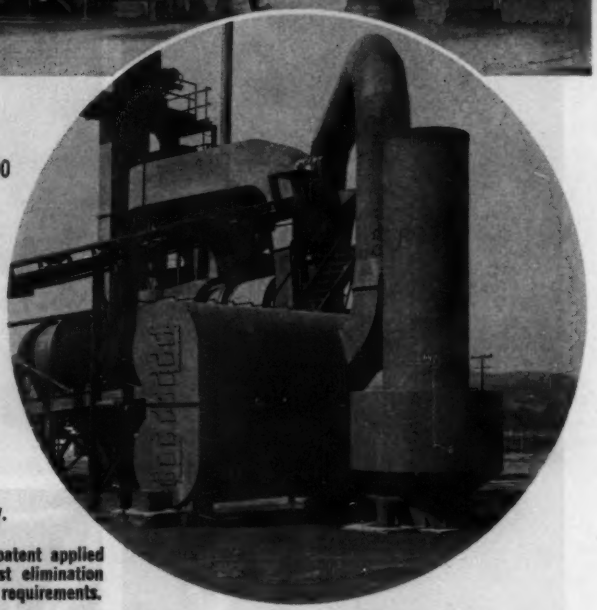
AMERICA'S CLEANEST ASPHALT PLANTS

Shown above is Industrial Asphalt's new STANDARD Model R-M 4000 pound Asphalt Plant, located in Escondido, California.

Fully equipped with the latest STANDARD improvements including the new "Cyclonic Wet Washer," this plant has been in daily production for some time, producing as high as 180 tons of hot mix per hour.

TODAY . . . see your STANDARD distributor! He can tell you in detail about all the many features of the STANDARD Asphalt Plants which add up to: lowest cost erection, lowest cost operation, lowest cost maintenance, plus highest tonnages — size for size.

STANDARD Asphalt Plants range in size from 1000-8000 lb. capacity.



STANDARD's new "Cyclonic Wet Washer" (patent applied for) assures added dust collection and dust elimination efficiency — meets all known air pollution requirements.

STANDARD
ASPHALT PLANTS
"THE WORLD'S FINEST"

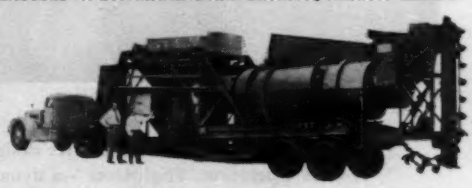
STANDARD STEEL CORPORATION
General Offices & Plant, 5089 Boyle Avenue, Los Angeles 58, California
Midwest Offices & Plant **LEADER IRON WORKS** *Decatur 89, Illinois*
(Division of Standard Steel Corporation)

. . . built to do a better job!

PARTS WAREHOUSES IN LOS ANGELES AND DECATUR, ILLINOIS

Attention Contractors! **The New STANDARD**

PORTABLE T. M. PLANT offers top production. A *complete* self-contained batch type Asphalt Plant . . . on wheels. One man operates! Has exclusive "SELF-LIFT" erecting device. RUGGED – ECONOMICAL – SIMPLE. Mixes up to 80 tons per hour!



ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

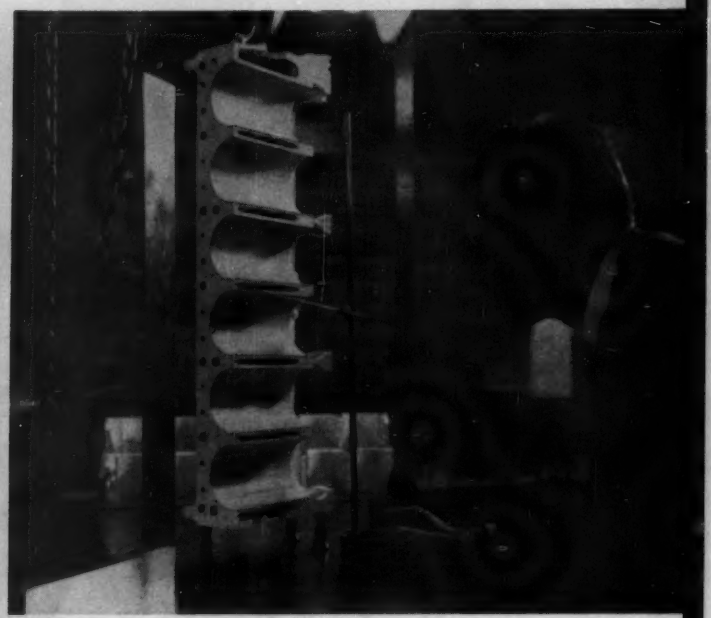
3 reasons why you eliminate

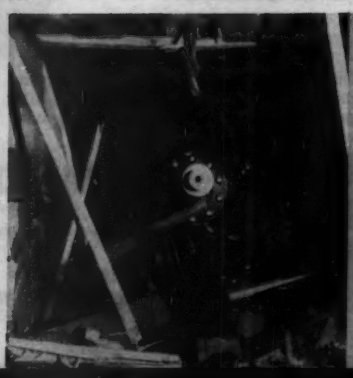
reason **1**

GMC has the most rigid quality-control standards* in the industry. Example—every truck must pass over 1,000 detailed inspections before it gets GMC's OK.

Cab Weld Test – Day-in and day-out, this hammer and chisel are probing spot welds everywhere on the cab, even the unseen, hard-to-get-at spots. Cabs *must* meet GMC perfection before they are released for mounting on the chassis.

Slicer Test – Periodically, standard production engine blocks and cylinder heads are pulled from the assembly line and sliced into 12 to 15 sections. Water jackets and passages, cylinders, supporting members and the like are all accurately checked to make sure they meet rigid blueprint specifications . . . make sure GMC Truck engines are rugged enough to stand up under the most extreme conditions.





Clutch Spin Test—Truck parts in this phase of the GMC quality-control program are subjected to conditions far beyond those experienced by truck owners. This is where we *try* to make parts break by spinning them until they fly into pieces. Then we find out why . . . and correct it.

* Rigid quality-control, creative designing and engineering are the results of Operation "High Gear"—a dynamic GMC program that is paying off with the greatest money-saving, money-making advances in truck history.

standbys with GMC TRUCKS!

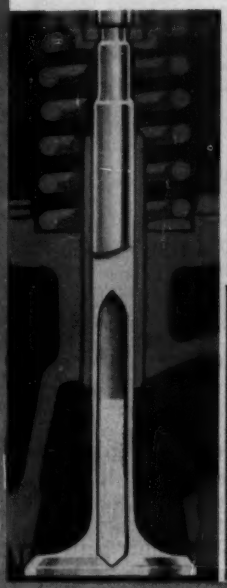
REASON **2**

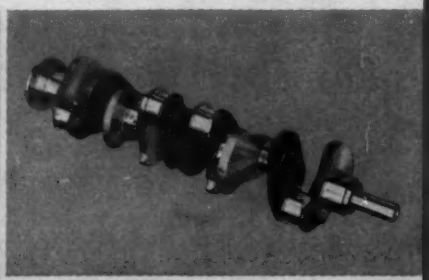
GMC Trucks have extra long life built-in throughout—and it's standard. Take GMC engines for example—

There's additional life and dependability in GMC engines with "free-turn", sodium-cooled exhaust valves. Localized hot spots are prevented. Heat is rapidly transferred away from valve heads.

(Upper). Forged, Tocco-hardened crankshafts in GMC engines have extremely hard, long-lasting bearing surfaces and softer cores for high torsional rigidity.

(Lower). Pistons are weight-controlled to within ⅛ oz. for balanced power. Rifle-drilled connecting rods assure positive piston pin lubrication. M-400 bearings last 7 times longer than others.



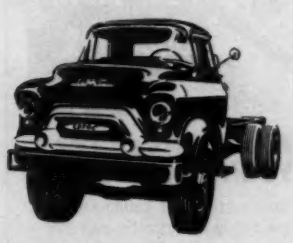


REASON **3**

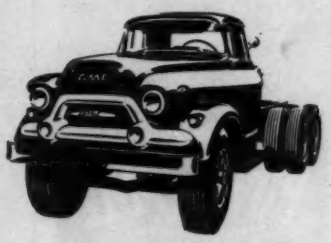
Your GMC Dealer's big parts stocks and factory-trained service eliminate costly delays and unnecessary down-time. Another time and money-saving GMC advantage—*one* warranty covers the complete truck, *both* chassis and engine.

THERE'S A DEPENDABLE GMC TRUCK FOR EVERY CONSTRUCTION HAUL!

GMC pickups are offered in over 30 different capacity, body and wheelbase combinations. Available with 4-wheel drive, Powr-Lok and all power assists.



GMC Dual-Purpose models have 89-inch BBC, best weight distribution and bigger body capacities. GVW to 46,000 lbs., GCW to 60,000 lbs., Six and V-8 power.



GMC builds the biggest selection of six-wheelers, including the lowest-priced model in the 35,000 GVW class. The most complete choice of components makes it easy to have a job-engineered GMC.

GMC
GENERAL MOTORS CORPORATION
TRUCKS

From ½-ton to 45-ton—
General Motors leads the way!

GMC TRUCK & COACH . . . A GENERAL MOTORS DIVISION

The Busiest Tool You'll Ever Own!

Construction and building users are highly enthusiastic over this time-saving . . . labor-saving . . . money-saving . . . man-saving device. Does hundreds of jobs Faster . . . Easier . . . Safer! Automatic let-down feature permits one man to lower 3000 lbs., one notch at a time with safety.

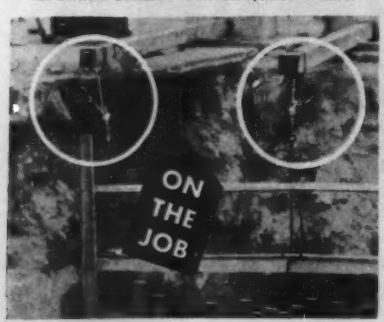
Steel frame, stress parts of high tensile manganese bronze, preformed aircraft cable.

- Set Forms
- Pull Motors
- Erect Towers
- Pull Vehicles
- Load Materials
- Rig Scaffolding
- Hoist Platforms
- Stretch Guy Wires

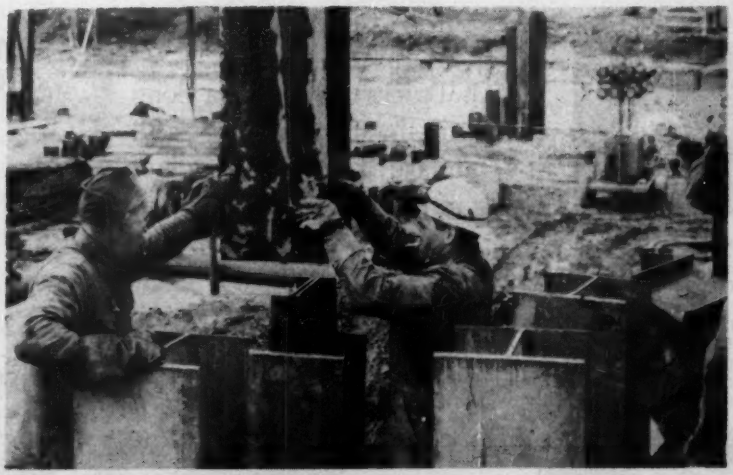
Tested To 50% Overload

1½ Ton Model Shown

Ask Your Jobber or Write to
THE AMERICAN CAGE & MANUFACTURING CO.
128 BAYARD STREET • DAYTON 1, OHIO • U.S.A.



Job Talk . . .



H-Pile Splice Slices Welding Costs

An H-pile splice sleeve fabricated of two channels back to back speeds piledriving for Gust K. Newberg Construction Co. in Chicago. The sleeve reduces the length of weld bead needed to splice 14-in. H-pile sections from about 166 in. to 86 in.

Newberg's job calls for driving 2,400 of these piles for the foundation of the Lakefront Exposition Hall. Piles were to be driven to a depth of 80 ft below lake level. This required 90-ft piles, which were too long to handle in one piece; hence the splicing.

The two channels making up the prefabricated splice sleeve were put together back to back with a space between equal to the thickness of the H-pile web. A rectangular steel spacer, which later acts as a key to fit the pile sections together, holds the two channels.

After driving the first section of pile, the contractor cuts off the battered top and scarfs the edges for welding. Then the crew sets the splice sleeve in place on top of the driven section. A workman cuts a notch into the web of the second section of pile so that it will fit the splice sleeve. Then it is lowered into place on the splice, and lightly driven to seat the sleeve. Finally the edge of each channel leg is welded to the inside surface of the H-pile flange, and the joint between flanges on the outside is butt-welded to complete the job.

Portable Pump Pushes Concrete Up to Roof

Mounted on a trailer along with the mixer that feeds its hopper, a 2L8 Moyno pump shoots lightweight vermiculite concrete to workmen placing the roof of a General Motors parts warehouse in New Orleans. Contractor Belou & Co. moves the portable unit around the building, keeping it close to the pour area.

Belou's job calls for a 2½-in. deck poured in place over corrugated metal forms set over the roof joists. The pump pushes the concrete through 400 ft of 3-in. hose upward to the roof area, where it is spread and screeded by workmen with an aluminum straightedge 16 ft long.

Production rates are good. A five-man crew places as much as 15,000 sq ft of roof a day. The

SPREAD FOOTINGS FOR HUGE PRATT & WHITNEY PLANT ARE DUG IN FLORIDA'S "IN THE DRY" EVERGLADES...

Pratt & Whitney Jet Engine Plant, West Palm Beach, Fla. — Contractor: Henry C. Beck Co., Atlanta, Ga.

MORETRENCH WELLPOINTS, surrounding an area 1000′ long and 500′ wide, made it possible for the contractor to construct spread footings, 12′ below ground water level, in the dry. Excavation was kept at a minimum — speeding progress on the job — cutting costs. Wellpoints remained in operation until all underground mechanical work was completed. Two 10″ Moretrench Pumps, pumping 2500 GPM each, worked continuously for approximately six months with no down time for repairs.

GOOD RESULTS · GOOD SAVINGS

These are the reasons why experienced contractors count on Moretrench Wellpoint Equipment to help them make money on wet jobs.

MORETRENCH *Corporation*

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No matter how tough the job...

CLEVITE 77 BEARINGS GIVE LONGER SERVICE!

When your equipment is operating constantly under adverse conditions such as heat, extreme loading and lugging, the performance "bonuses" of Clevite 77 bearings really pay off.

Take loading—the combination of steel backing with a *cast* copper-lead lining has greater fatigue strength than any other bearing material. And the steel back thickness is increased on service undersizes to provide new engine performance on reground shafts. This construction also offers maximum heat dissipation to combat the heat problem.

Add to these benefits those you get from Clevite 77's precision electroplated .001" lead-tin overlay—superior surface action including corrosion resistance, embeddability and conformability. And a patented nickel plate separating the overlay from the copper lining guarantees these benefits longer.

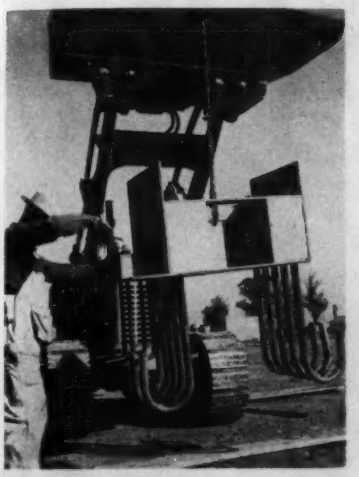
It all adds up to one proven fact. If you're talking heavy-duty, Clevite 77 will give you better service than any other engine bearing. And the coverage and service you get from N.A.P.A. makes it easy for you to use the best. Get in touch with your N.A.P.A. jobber for more details on the Clevite 77 bearing—or write Clevite Service, 6545 Carnegie Avenue, Cleveland 3, Ohio.

Monmouth ENGINE BEARINGS

*The words Monmouth, Clevite and Micro are registered trade marks of Clevite Corporation

CLEVITE SERVICE: Cleveland Graphite Bronze • *Division of Clevite Corporation* • Cleveland 3, Ohio

men work continuously, even through lunch hour, to eliminate the need for cleaning out the hose during work stoppages.



Templet Holds Anchor Bolts

A simple wooden box, 41½ in. long, 26 in. wide, and 18 in. deep, forms a templet that holds 750 lbs of J-shaped anchor bolts for the foundation of Western Pacific Electric Co.'s new plant addition at Santa Clara, Calif.

Contractor Carl Swenson Co., Inc., San Jose, Calif., devised the foundation system in cooperation with Nathan Karp, foundation engineer of San Francisco. The anchor bolts are unusually heavy because they must support not only the building's columns but also two 35-ton capacity gantry cranes.

The contractor first places an 11-ft-long, 4-ft-high cage of reinforcing steel in the bottom of each of the 22 foundation trenches. Each trench is 6 ft deep, 12 ft long, and 30 in. wide. Then two anchor bolt assemblies are set on top of each cage, and concrete is poured into the trench, forming two 5½-ft-long, 28-in.-dia reinforced concrete bells.

Each templet holds 14 bolts. Ten of the bolts are kingsize 2½-in.-dia J bolts that are 4½-ft long and weigh 71 lbs apiece. Four smaller 26-in.-long, 1⅛-in.-dia bolts on one side of the box complete the anchorage assembly. Bethlehem Pacific Coast Steel Corp. manufactures the bolts and nuts.

ONLY RAMSET has the exclusive RED TIP fastener

WOOD TO CONCRETE
STEEL TO CONCRETE
WOOD TO STEEL
STEEL TO STEEL
INTO STEEL
INTO CONCRETE
Red Tip serves as guide in barrel of tool, and indicates proper penetration.

with guaranteed performance

Red Tip fasteners—over 100 threaded studs, drive pins and eye pins—are made to do a *better* fastening job into concrete or steel. Produced from top-quality steel and austempered for extra strength, these fasteners are your best buy for efficient, trouble-free powder-actuated fastening.

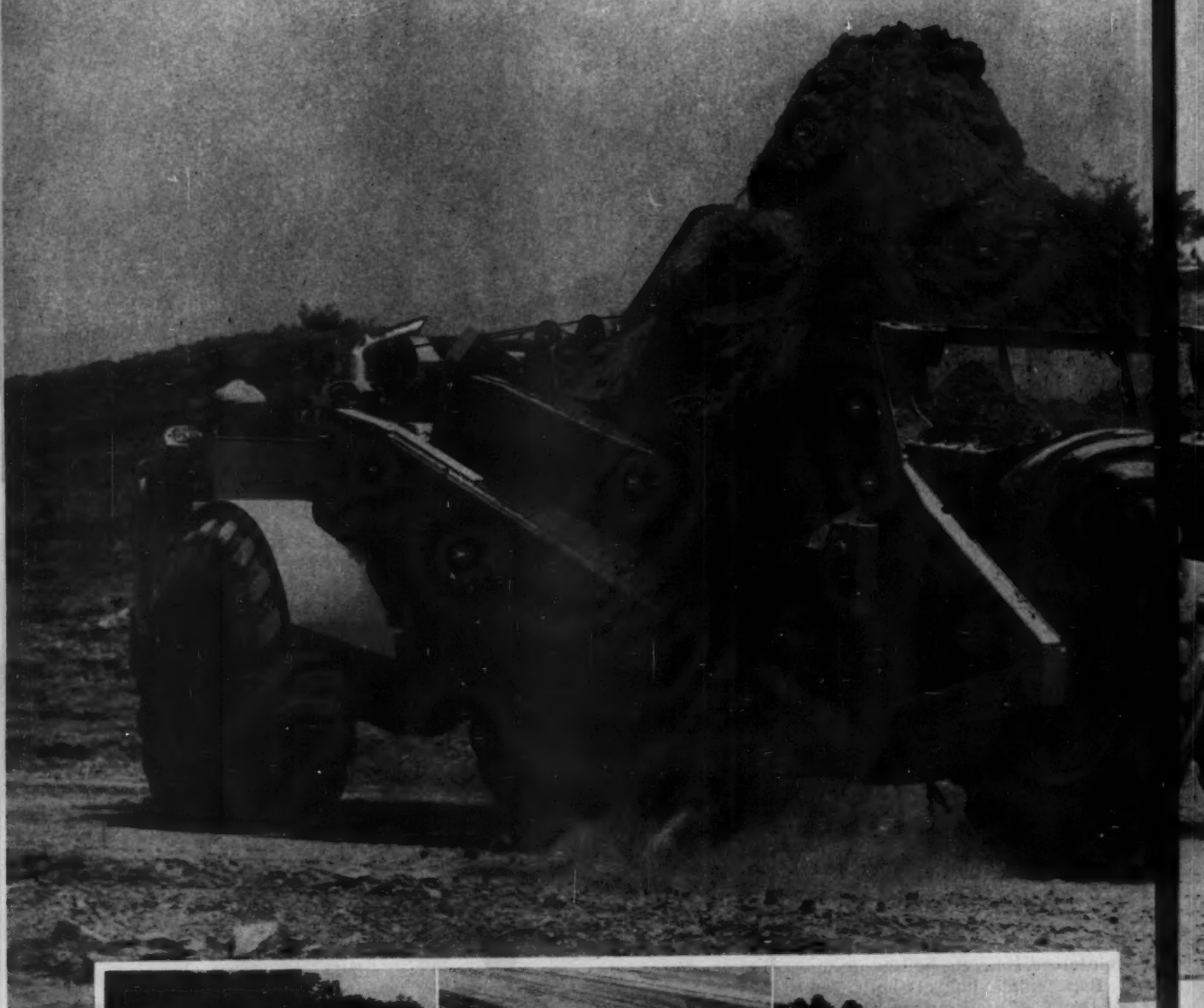
Ramset Red Tip fasteners are guaranteed on every approved application! Under Ramset's unique "100-for-100" guarantee, you pay only for the number of fasteners called for on your plans. Insist on the Red Tip fastener... call your Ramset dealer today for details—he's listed under "Tools" in the Yellow Pages!

In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set® hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset Fastening System

WINCHESTER-WESTERN DIV. • OLIN MATHIESON CHEMICAL CORPORATION
289 WINCHESTER AVENUE • NEW HAVEN 4, CONNECTICUT

PUT YARDS AH
PRODUCTION ON



See for yourself what we mean by the "Yards Ahead" performance of the Curtiss-Wright scraper line. Make your own guess of how many yards of tough clay, shale and rock are packed in the heaping bowl of this Curtiss-Wright model CW-226! Even at the most conservative estimate, you'll agree that this is the high production you want on your job. Remember, this is no ordinary machine . . . It is the CW-226—largest two-axle scraper on the market . . . one of the five that are working on Talbott Construction Corporation's Erlanger, Kentucky road construction contract . . . another job being completed faster and more profitably by the "Yards Ahead" performance of Curtiss-Wright scrapers.

CURTISS-WRIGHT CORPORATION
SOUTH BEND DIVISION, SOUTH BEND, IND.

AD-NO. 52-44

SOUTH BEND DIVISION
CURTISS-WRIGHT
CORPORATION
SOUTH BEND, INDIANA

CW

KOEHRING HEAVY DUTY

new equipment review

Looking for new ways to get lower costs, *more profit* on your excavating, loading, erecting, off-road hauling, or paving operations? Then take another look at the new machines and methods reviewed here. These are only a few of the many new sizes and types of equipment recently added to the bigger-than-ever Koehring® line.

Long identified with heavy-duty equipment design *and quality*, Koehring has *doubled* its line in these last few years through a concentrated program of new product development. This program is being continued. So, *keep your eye on Koehring* for new opportunities to cut construction costs . . . and get *more work capacity* . . . earn *more profit* per dollar of equipment investment! For up-to-the-minute facts and figures, your Koehring distributor is the man to see. *Why not call him today?*

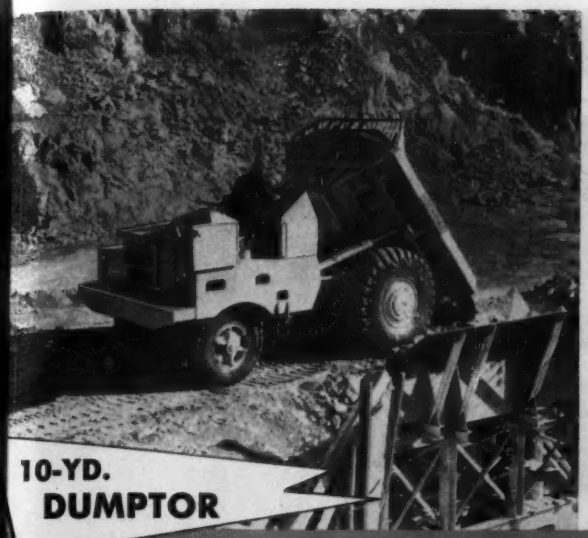
KOEHRING
DIVISION OF KOEHRING CO.
Milwaukee 16, Wis.

In Canada:
KOEHRING-WATEROUS LTD.
Brantford, Ontario

30-TON 330

30 to 120-ft. boom . . . 150 ft. with jib

Here's *extra* capacity, *extra* reach you can use with complete safety. Boom-angle indicator and operator reference guide show max. safe load capacity at every boom length and angle. High-strength pin-pad connected boom permits "2-man" boom-length changes. Power-lowered A-frame removes counterweight. Boom, outriggers also removable for roading. The 330 increases Koehring line on rubber to 7 models: 15, 25, 30, 35, 45-ton truck cranes . . . 15, 25-ton Cruiser® cranes.



10-YD. DUMPTOR

has pivoting seat . . . 2-way controls

No-turn shuttle hauling is more efficient than ever! Big, new 10-yd. Koehring Dumptor® brings you 30,000 lb. payload capacity . . . 20.8 mph speeds in *both* directions . . . *plus* 2 sets of controls at pivoting seat. Operator always faces direction of travel. There's power steering . . . constant-mesh transmission . . . hydraulic speed-range clutches . . . torque-converter drive . . . instant gravity-dump, or *controlled*-gravity with hydraulic cylinders. A Koehring 6-yard Dumptor is available, too.

SKOOPER

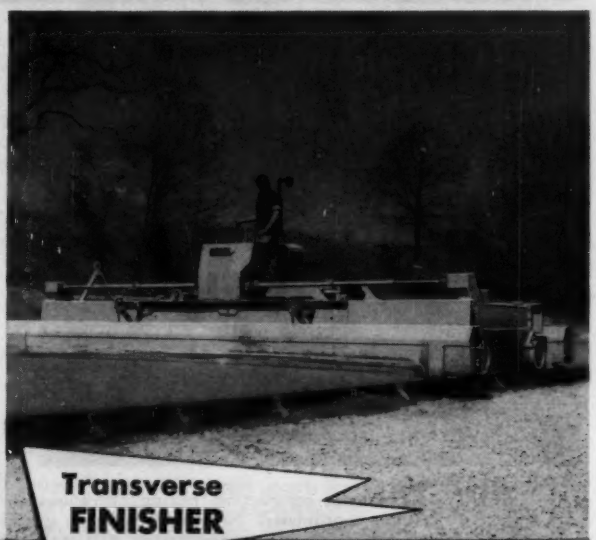
revolutionizes digging . . . loading

Full-revolving, free-swinging Koehring SKOOPER™ digs, hoists, swings, dumps . . . then swings back to digging position *without traveling*. Twin hydraulic rams crowd the 2-yard bucket along smooth 7-foot level cut from *"stand-still"* position . . . or cut at any angle of bank slope. Eliminates high track or tire maintenance of conventional drive-in, back-out, skid-turn loaders. 3 types interchangeable buckets: rock . . . re-handling . . . and general-purpose. Excavator-crane convertibility.

SPRAWLER

outlifts its own weight by 14%

With pivoting outriggers sprawled into position, 545 SPRAWLER™ lifts up to 90,000 *lbs.* (Weighs approx. 79,000 lbs.) Raise pedestals for ground clearance, or remove pedestals and swing outriggers against crawlers . . . and the 545 walks with 61,500-lb. load! Has 40 to 120-ft. pin-pad connected boom (with angle indicator) . . . max. *150-ft.* boom-and-jib. Strips for transport to approx. 47,500 lbs. *with crawlers intact.* 6 other Koehring crawler models: 10 to 95 tons (½ to 3-yards.)

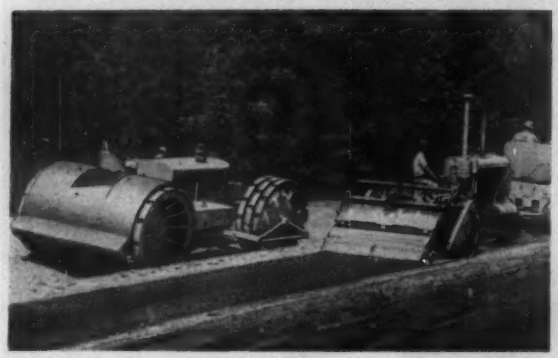


Transverse FINISHER

now in Koehring paving "package"

Featuring a single-lever adjustment for quick crown changes, this one-man-operated Transverse unit finishes slabs 10 to 30 feet wide. Adjustable-width frame extends, retracts hydraulically. 2 oscillating screeds . . . 3 stroke speeds . . . 3 traction speeds finish any slump concrete. Additional high speed for traveling. Optional rubber-tire transport wheels raise, lower hydraulically. Also check: Koehring Longitudinal finisher; 34-E, 16-E twinbatch® pavers. Call Koehring distributor for details.

. . . K-45 KOMPACTOR averages 3,000 lineal feet per day



A smooth-running job

All mixing, compacting, paving operations are closely coordinated. First, bulk cement is spread on grade. Next, tractor-drawn pulverizers (above) make a "dry" pass over roadbed, mixing cement with soil. Then, a second pass is made re-mixing soil-cement and adding water. Next comes segmented Kompactor to compact the mixed soil-cement. After 3-day curing time, paving crew moves in, applies surface coats.

Construction of stabilized soil-cement base required careful timing on this road paving project. Two pulverizer-mixers, cutting to a depth of 6 inches, mixed soil-cement on the grade, adding water on the final pass. High compaction densities had to be obtained fast, during brief period while materials retained proper moisture content. This was no problem with a big Buffalo-Springfield® K-45 Kompactor® on the job. Operating at speeds up to 5 mph, this self-propelled, segmented roller easily kept up with the pulverizers . . . helped complete 3,000 feet of soil-cement base daily.

The K-45 applies a unique, "interrupted-pressure" action that meets required densities in sand, gravel, clay, common earth, etc., in fewest passes. Staggered rows of individual steel pads on giant roller wheels exert *all* compaction effort *downward,* give uniform density of fill from lower elevation to top level. Check Kompactor performance. See how *you* can get better compaction in less time, at lower cost. Call Buffalo-Springfield distributor today.

B900

BUFFALO-SPRINGFIELD CO. SPRINGFIELD, OHIO Division of Koehring Co.

PNEUMATIC TIRE • VIBRATORY • SEGMENTED ROLLERS • 2 AND 3-AXLE TANDEMS • 3-WHEEL ROLLERS • KOMPACTOR

Hypoid Single-Reduction Gears Make TIMKEN-DETROIT® LIGHTWEIGHT TANDEMS FIRST CHOICE

for plus-profit payloads!

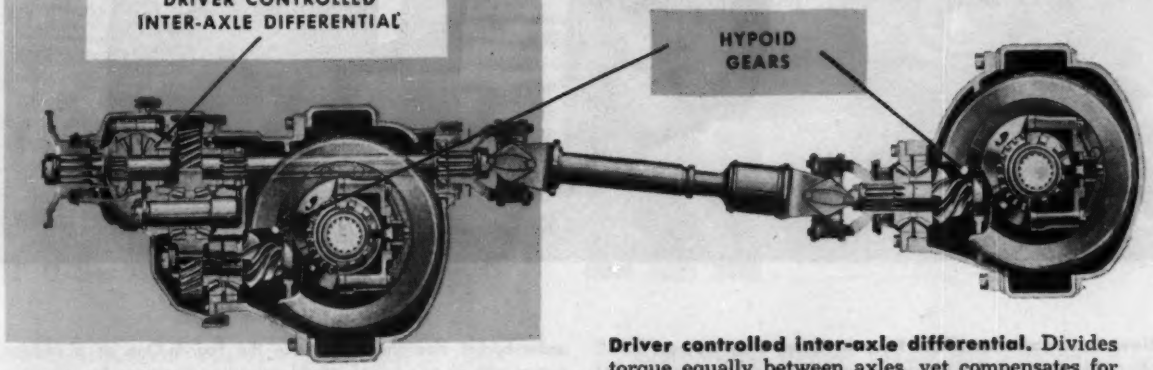
For more than three years Timken-Detroit Lightweight Tandems with Hypoid Single-Reduction Gears have been *first choice* with over-the-highway operators. Here are some of the reasons why:

Up to 700 lbs. lighter. Lighter in weight than other tandems currently available, Timken-Detroit's efficiency of design is unmatched in the industry. This not only means lower initial cost but *greater revenue from every payload.*

Hypoid gearing. Provides up to 30% more strength than spiral bevel gearing of the same size. Stronger design gives longer life and lower maintenance costs. To match hypoid gear performance, a spiral bevel gear must be larger and heavier.

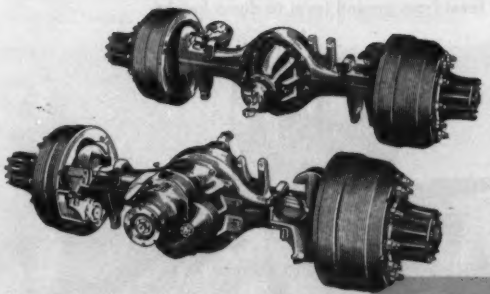
Widest choice of axle ratios. Because of the stronger hypoid gear set, it is practical to provide high numerical axle ratios up to 8.6 to 1. To provide axle ratios greater than approximately 7 to 1 with spiral bevel gearing, some form of auxiliary ratio multiplication is required. This increases both weight and cost.

"In-Line" through drive. Eliminates compound angles, and reduces drive line wear and maintenance. Differential carriers are centered to permit common axle shafts.



Driver controlled inter-axle differential. Divides torque equally between axles, yet compensates for any differential of speed between the axles. Both axles are always doing equal amounts of work. Can be locked out at any speed when poor traction conditions exist.

Tough, Torsion Flow Axle Shafts Are Best By Any Test. Don't be misled . . . patented Torsion Flow Axle Shafts are still the best available to the American Trucking Industry. Comparison tests prove that Timken-Detroit Axle Shafts, spline diameter for spline diameter, are the toughest ever made.



World's largest manufacturer of axles for trucks, buses and trailers

©1959, R-S Corp.

Another Product of...

ROCKWELL-STANDARD CORPORATION

ROCKWELL R STANDARD ®

Timken-Detroit Axle Co. of Canada, Ltd., Windsor, Ontario

Automatic hydraulic self-leveling bucket gives the operator a clear view with the International Wagner loader —unobstructed by cumbersome mechanical linkages. Big, ⅝-cu yd bucket is 64 inches wide, has 3,500-lb capacity. Notice how unsightly external hose connections are eliminated by T-340 internal pump design.

New International Drott Four-in-One. Only the new T-340 offers this versatile, high-production unit in the utility crawler field! Left below, showing exclusive clamshell action for "surrounding" materials, or dozing close to green foundations without excessive ground pressure. Right, bottom-dump action provides 9 ft, 6-inch under-bucket clearance. Also, use the Four-in-One as a regular bucket with ¾ cu yd (SAE struck) capacity; a scraper for inch-close grading accuracy; or a bulldozer with adjustable, radius-controlled moldboard for live, earth-rolling action. Parallelogram linkage holds bucket level from ground level to dump height.

already, they're calling it the

"terrific" T-340

New 45 hp* International Crawler leads its field in *POWER · SPEEDS · STEERING · EQUIPMENT!*

Reports from new T-340 users express amazement at its capacity . . . *its push and pull power*, compared with what they expected from a 31 drawbar hp rating. But when you measure the T-340 against its field, you see the reasons!

- **A quiet, smooth-running, 4-cylinder engine** with a proven pedigree for stamina and fuel economy.
- **Characteristic IH power-weight ratio,** delivering 95 per cent of the T-340's *built-in* operating weight of 5,600 lb as pull at the drawbar.
- **Job-matched speeds.** Only the T-340 in its power class offers Torque Amplifier Drive—providing *two* speeds in each of the five regular gears, letting you boost pull power up to 45 per cent, *on-the-go*, without declutching. Or, equip the T-340 with Fast Reverser, giving you *five reverse speeds*, each 22 per cent faster than the corresponding forward gear speed.
- **High-capacity, internal hydraulic pump,** gives instant-quick, fast-cycle equipment control.
- **Exclusive new planetary steering and final drive** —quick, easy pivot or "feathered" turns.

*Maximum flywheel hp

Measure the new T-340 by either price or performance . . . you'll quickly see why it's easily today's top value in the utility tractor field. See it *soon!*

Ask your IH Dealer to demonstrate . . . see for yourself how smooth, 4-cylinder power, planetary-type steering, balanced power-weight ratio and other features put the T-340 at the head of its class! For name of the IH dealer nearby, and descriptive literature, write International Harvester Company, Dept. AB-9, P. O. Box 7333, Chicago 80, Illinois, *today*.

See Your
INTERNATIONAL HARVESTER Dealer

International Harvester Products pay for themselves in use —Farm Tractors and Equipment . . . Twine . . . Industrial Tractors and Equipment . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

New International hydraulic bullgrader, is raised, lowered, tilted, and angled to right or left—all with fingertip hydraulic control. Blade is 85-inches wide and 25 inches high, plus a 7-inch center spillboard. Can be used in combination with scarifier, winch, and other rear-mounted equipment.

International Wagner Loader and backhoe can be mounted separately or in combination to form a highly efficient trenching, backfilling, and loading unit. Backhoe can be equipped with regular, mole's paw, bell hole, cemetery, or heavy-duty street repair bucket.

UDT-817 power crushes 300 cu. yd. of 1¾-in. minus caleche rock hourly

This is a Texas-sized crushing job—300 cu. yd. of caleche crushed to 1¾-in. minus size hourly—and the new 6-cylinder turbocharged International UDT-817 diesel does it with power to spare.

The West Texas Construction Co., Lubbock, is crushing 20,000 yd. of caleche for road base material at this pit near Perryton for a 5-mile state road improvement contract. The big new International UDT-817 power unit is delivering only 265 cont. hp. @ 1800 rpm. on the Universal impact crusher with production being limited only by feeder capacity. About 85% of the caleche requires crushing.

Other International power on the job includes a UD-18A diesel on the Jaeger 315 air compressor operating the wagon drill boring dynamite holes and a carbureted U-264 engine on the Universal feeder.

While the new 385 hp. UDT-817 diesel heads up the International engine line, you can choose from 31 other diesel and carbureted models ranging upward from 16.5 hp. Save on repowering and operating costs by checking your International Power Unit Distributor or Dealer or by specifying dependable International power in new machines. All 32 International engines have one common feature: Fastest payback power.

MAJOR POWER SOURCE for this portable Universal crusher is the new International UDT-817 diesel on the impact crusher. Feeder power is supplied by an International U-264 carbureted power unit. Conveyors and screens are electric powered. Output: 300 cu. yd. of caleche crushed to 1¾-in. minus size hourly.

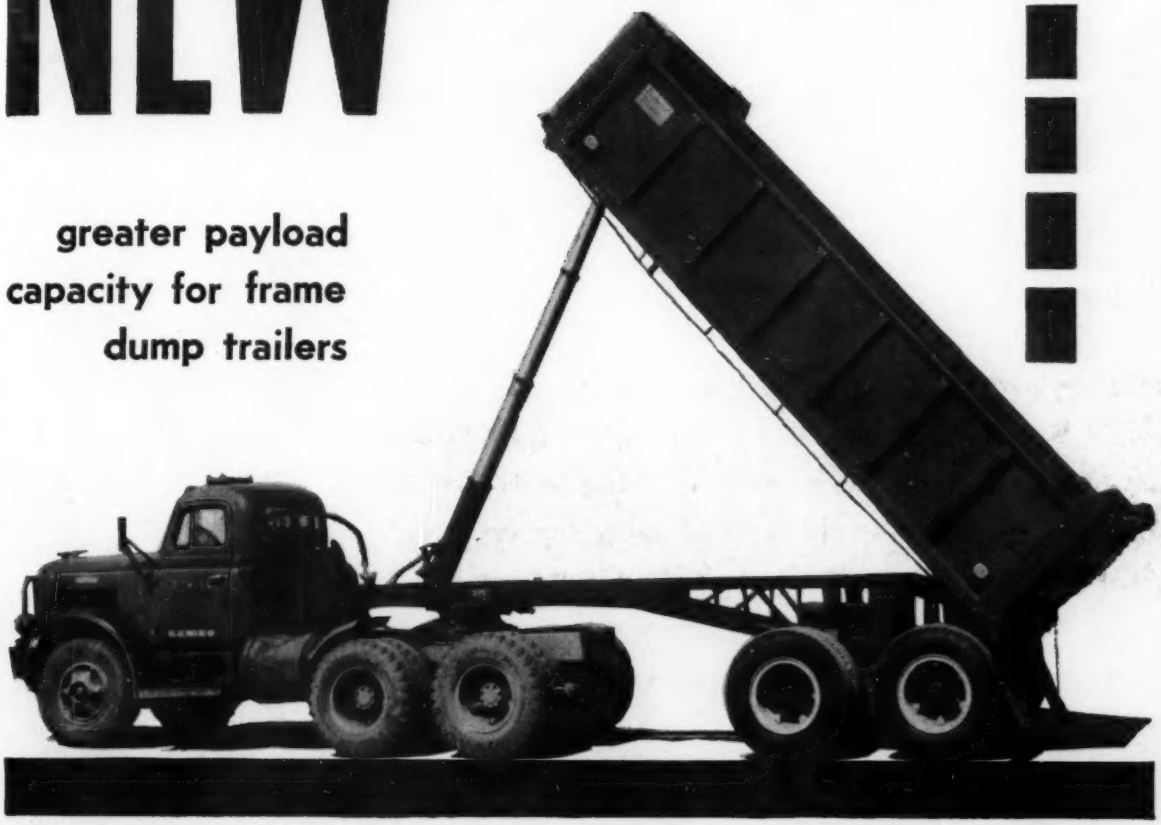
International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

NEW TALBERT'S "SKELETON – FRAME"

greater payload capacity for frame dump trailers



Talbert's "Skeleton-Frame" construction provides the stability of frame-type Dump Trailers . . . PLUS . . . the increase of thousands of pounds to your payload! Only Talbert combines the features of frame construction with "frameless" light weight.

CHECK AND SEE . . . you'll agree Talbert gives more!

STABILITY AND SAFETY—All axles are securely on the ground during lift.

PROVEN WEIGHT DISTRIBUTION—Usually not found in frameless trailer designs.

EASIER HANDLING—More reliable in tough unloading areas.

HIGHER STOCK PILING — Reduces rehandling costs and material storage areas.

Don't chance it! Get that extra margin of safety! . . . with increased payload! Talbert's "Skeleton-Frame" Dump Trailer is available in 20 and 26 foot lengths. Get Talbert Trailers for longer service with less maintenance. Your Talbert Distributor will gladly tell you all about it . . . see him today . . . or write for complete information!

Talbert Trailers, Inc.
7910 WEST 47th STREET
LYONS, ILLINOIS

Speeds construction of longest inland bridge in Texas with Gulf

GULF MAKES THINGS RU

Most bridges span rivers or canyons. But deep in the heart of Texas, the new Miller's Crossing Bridge is being built across a dry basin which will soon become a man-made lake covering a 57 square mile area.

The new lake and the bridge are part of the $20,000,000 Iron Bridge Dam and Reservoir being built for the city of Dallas and the Sabine River Authority. The reservoir will provide water for Dallas and Greenville. Also excellent recreational facilities.

The two-mile Miller's Crossing Bridge will be the longest inland bridge in Texas. Substructure and decking are being formed with concrete supplied by Wemix Company of Greenville, Texas, subcontractors to the builders of the bridge, Cage Brothers of San Antonio.

Gulf supplies Wemix with all fuels and lubricants used in their equipment. Construction of the bridge is running ahead of schedule—good evidence that Gulf makes things run better for Wemix and for the whole project as well.

Clean-burning Gulf fuels and clean-working Gulf lubricants keep Wemix's engines running cleaner and longer between overhauls. What's more, Wemix gets

job-site d
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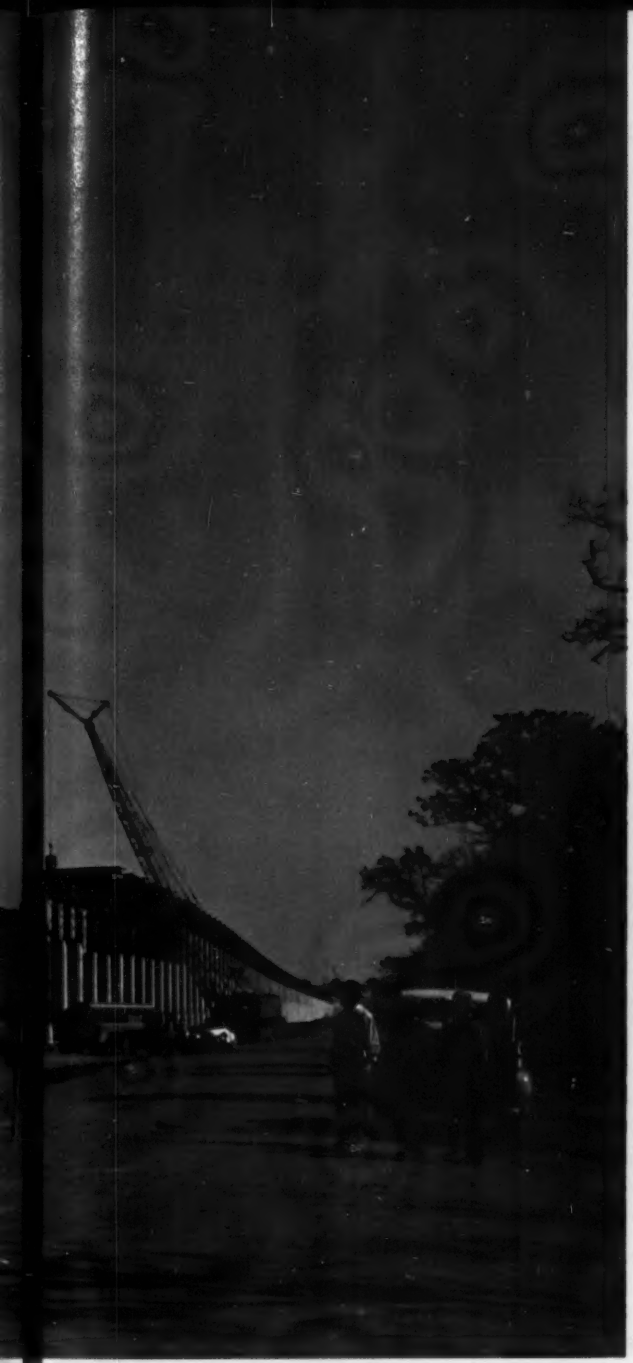


Only lift of its kind in the country. Hydraulic hoist, designed by Cage Brothers, lifts steel pans into position five at a time. Watching operation are, left to right, V. F. Hickman, Project Manager, Cage Bros.; H. D. Baker, Owner of Wemix; H. Maden, Job Foreman, Cage Brothers.

Shown here are, left to right, H. W. Inglish, Jr., Gulf Distributor at Greenville; H. D. Baker, Owner of Wemix; L. W. Kendrick, Gulf Assistant District Manager, Tyler District.

Wemix Company pouring concrete for substructure of the new two-mile long Miller's Crossing Bridge.

Gulf fuels, lubricants and service...

RUN BETTER!

job-site delivery of Gulf products in volume, and can always rely on Gulf representatives for on-the-job technical assistance.

That's the kind of service you can count on from Gulf. Small wonder that in Gulf's marketing area, contractors on big construction projects use more Gulf fuels and lubricants than any other brand.

How about your projects? See how Gulf makes things run better. Just call your nearest Gulf office. Meanwhile, send for Gulf "Contractors' Guide"—the maintenance "bible" for heavy equipment.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Please send latest edition of ☐ "Contractors' Guide"
☐ Gulf and Your Business

Name_____

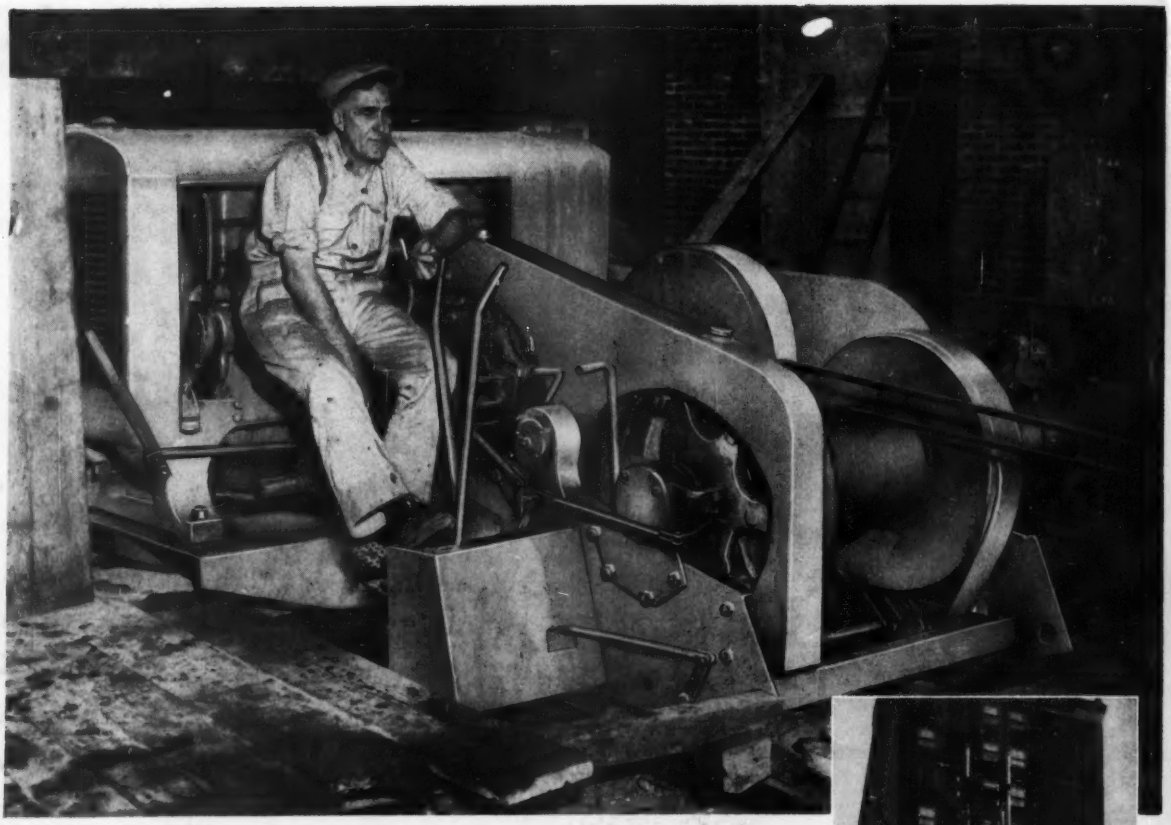
Title_____

Company_____

Address_____

City_____ Zone____ State_____

SP 9613



"The finest hoist I ever operated"

Ask the operator on any job why he likes his Clyde and he'll tell you feature by feature.

Maybe the internally expanding band friction clutch, its extremely easy and smooth engagement and release and the elimination of shock loads is a feature he appreciates most. Or the fact that he need only 'toe' the extra heavy duty, large diameter brake for safe, sure and accurate load control.

No doubt he will tell you about some of the many other features he likes . . . anti-friction bearings throughout that result in greater line pull with less power . . . low cost maintenance as well as low operating costs . . . correct diameter, semi-steel drums that afford smooth and rapid free spooling.

Clyde operators and owners too, are Clyde's best hoist salesmen . . . the finest compliment that can be paid to the modern engineering and precision manufacture of the Clyde line of finest quality material handling equipment.

For the complete story on the advantages of Clyde's design, write for Bulletin 34A.

This 15-story parking garage in St. Louis is but one of the many jobs on which this Clyde Hoist has helped to maintain or even better construction schedules.

CLYDE

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

CLYDE IRON WORKS, Inc.

Established 1899
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : UNLOADERS
BUILDERS TOWERS : CAR PULLERS : ROLLERS

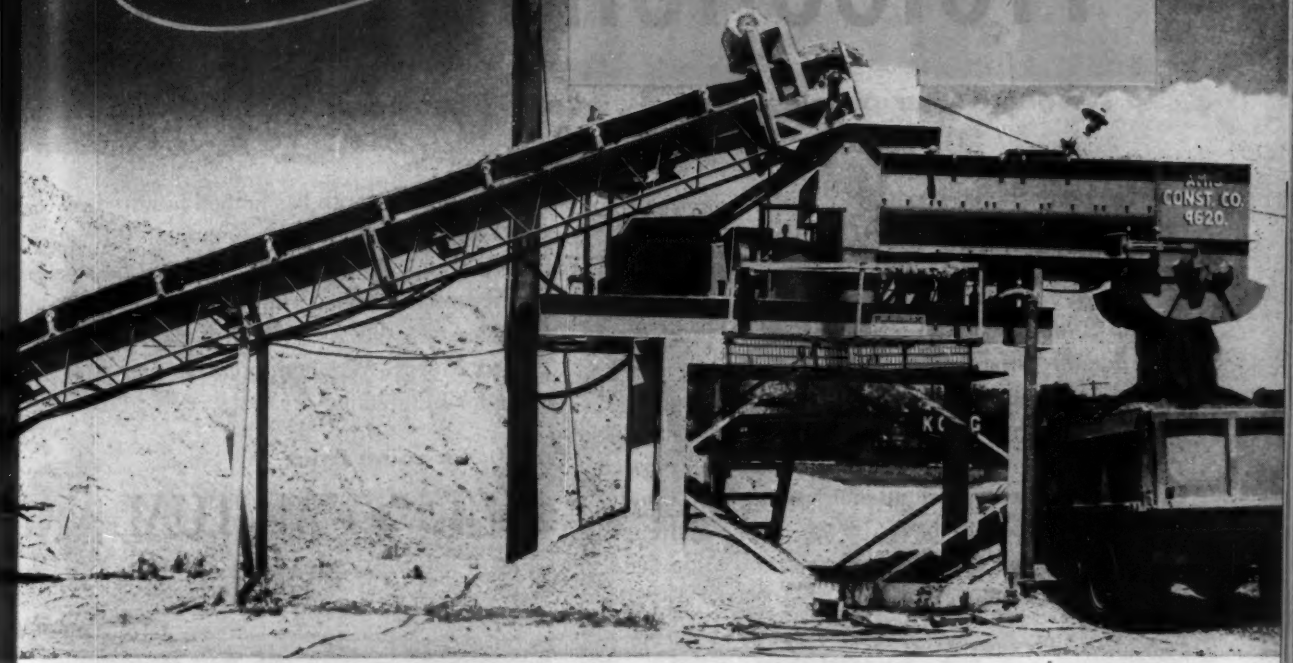
Want lowest cost per ton?

buy Cedarapids Built by IOWA

Stabilized Base Mixer Produces

700 TONS PER HOUR

for Oklahoma Interstate Rt. 35



STABILIZING AGENT ATTACHMENTS MEET MIX SPECIFICATIONS

With this versatile unit, you can mix a controlled amount of water with the aggregate, or add calcium chloride, Portland Cement or emulsified asphalt, as specified. Cedarapids feeders provide precise metering of these materials into the mixer.

That's a production record for plant-mixed stabilization material in Oklahoma! Specifications called for a particularly high quality of mix, too. But Amis Construction Company's Cedarapids Twin-Shaft Stabilized Base Mixer blended three sizes of aggregate, mixed it thoroughly with a precisely controlled amount of water, and produced over 700 tons of stabilized aggregate base per hour! In other States, Cedarapids Stabilized Base Mixers are producing as high as 860 tph as a measured minimum!

Production like this is one of the many Cedarapids benefits that assure lowest cost per ton. In the Stabilized Base Mixer, and *every* plant or component in the complete Cedarapids Line, engineering emphasis is placed on high production, the ability to meet strict specifications, and low-cost operation. It adds up to more profit on each ton you produce!

Bulletin SBM-1 gives complete engineering details of the two sizes of Cedarapids Stabilized Base Mixers. Send for your copy today.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

New ways Liberty Mutual provides

Protection in depth

to safeguard your people... to cut workmen's compensation insurance costs

The best way for a contractor to cut his compensation insurance costs, without sacrificing any of the protection his business needs, is to start right now to cut down on accidents. To help you in this job, Liberty Mutual can make available a broad range of extra skills and resources.

This is Liberty's protection in depth. It includes a trained force of field engineers... two rehabilitation centers.. 1,400 claimsmen... an 86-acre Research Center. These, plus all our other protection-in-depth services, are backed by the financial strength of the largest writer of compensation insurance.

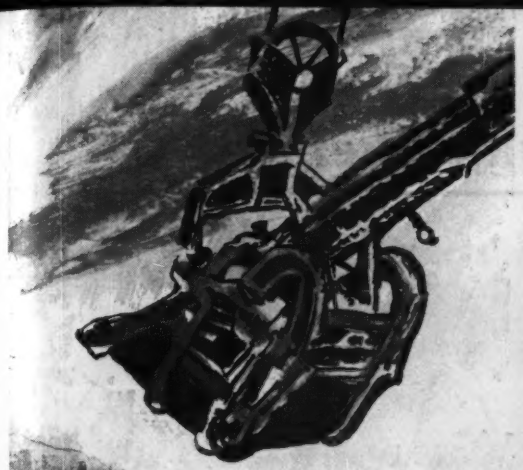
Protection in depth has helped hundreds of construction policyholders save money through reduced compensation rates. And it has helped Liberty return more than $491 million in dividends. You can buy this protection in depth only from Liberty Mutual. Write or phone our nearest branch office for full details.

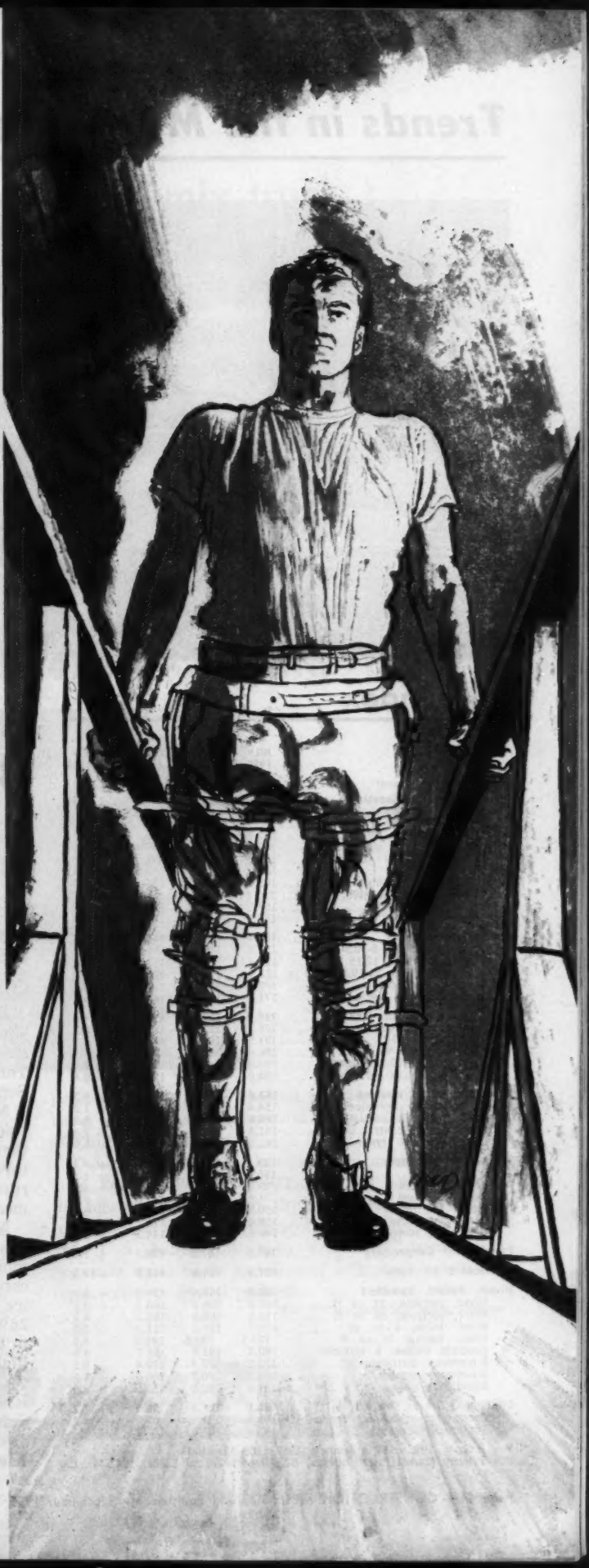
Look for more from

LIBERTY MUTUAL

...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY • HOME OFFICE: BOSTON
Business Insurance: Workmen's Compensation, Liability, Group Accident and Health, Fire, Fleet and Crime
Personal Insurance: Automobile, Fire, Inland Marine, Burglary, Homeowners'





Above

Accident victim gets quick help. If there's an accident on your job, a Liberty claimsman makes sure that proper medical care is available. Where large projects require it, one of these men lives right on the job. This fast, thorough claims service has helped hundreds of construction policyholders cut compensation costs.

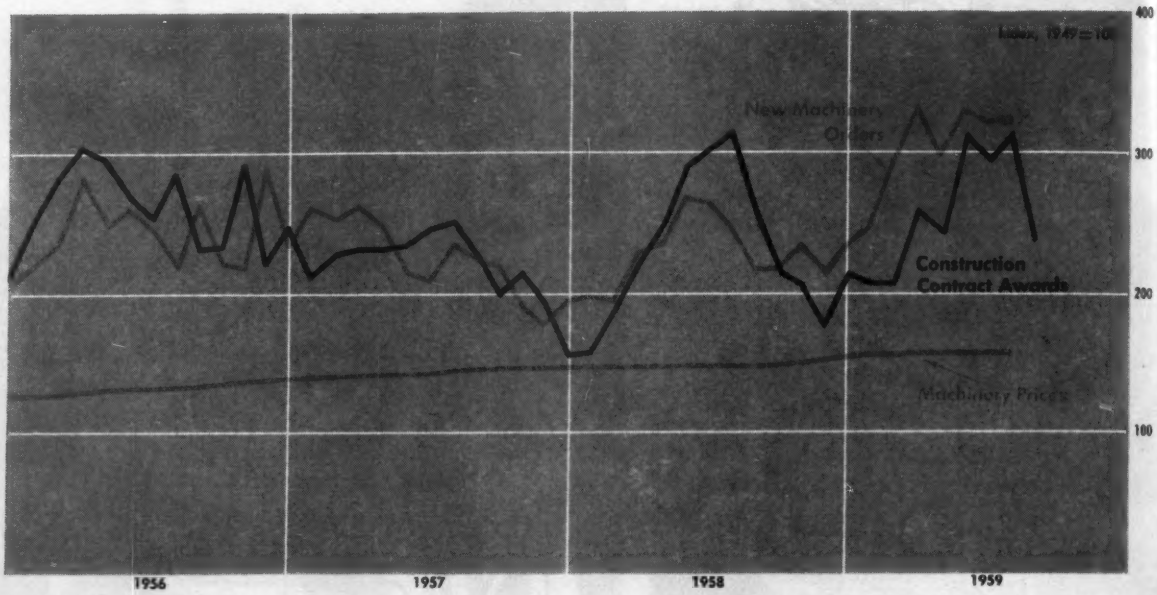
Right

Severely injured employees of policyholders can make use of Liberty's rehabilitation centers in Boston and Chicago. Here, through therapy and prosthetics, patients help themselves recover and return to productive work. Types of injuries treated include bad fractures, amputations, torn muscles and back injuries.

Left

Dynamite under control. To protect buildings from blast damage, Liberty's engineers developed a ground-vibration recording instrument that tells how much dynamite can safely be used in a particular locale. The "accelerograph," as it is called, has helped cut insurance costs on such jobs as the New York Thruway and the Massachusetts Turnpike.

Trends in the Machinery Market



Price Index

	JULY 1959	MONTH AGO	YEAR AGO	% CHANGE 1958-1959
All Types of Equipment	172.2	172.1*	165.5	+ 4.0
Cranes; Draglines, Shovels	**168.6**	**168.4**	**163.8**	**+ 2.9**
Shovel, ½ cu yd	163.3	163.3	154.0	+ 6.0
Shovel, ¾ cu yd	172.5	172.5	167.7	+ 2.9
Shovel, 1-1½ cu yd	181.9	180.6*	178.4	+ 2.0
Shovel, 2-2½ cu yd	162.1	162.1	154.4	+ 5.0
Shovel, 3-3½ cu yd	167.8	167.8	162.7	+ 3.1
Shovel, 6 cu yd	188.2	188.2	180.1	+ 4.5
Crane, truck mounted	165.7	165.7	164.2	+ 0.9
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	157.5	157.5	152.7	+ 3.1
Bucket, dragline	169.3	169.3	180.8	- 6.4
Scrapers and Graders	**165.7**	**165.7**	**158.8**	**+ 4.3**
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	156.8	156.8	151.3	+ 3.6
Scraper, 2 Wheel, 15-19.5 cu yd (a)	123.7	123.7	122.7	+ 0.8
Grader, heavy duty	172.6	172.6	164.0	+ 5.2
Grader, light & medium	171.1	171.1	161.2	+ 6.1
Tractors (non-farm, incl industrial)	**188.2**	**187.8**	**180.5**	**+ 4.3**
Wheel-type, off highway (a)	128.2	128.2	128.4	- 0.2
Crawler-type, 50-74 dhp	191.9	191.9	182.6	+ 5.1
75-99 dhp	196.4	196.4	185.8	+ 5.7
100-154 dhp	191.3	191.3	186.7	+ 2.5
155-.80 dhp	204.0	204.0*	191.8	+ 6.4
Machinery, Tractor Mounted	**168.6**	**168.6**	**161.7**	**+ 4.3**
Dozer, cable controlled	154.4	154.4	151.6	+ 1.8
Dozer, hydraulic controlled	186.6	186.6	177.3	+ 5.2
Cable power, control unit	151.4	151.4	147.9	+ 2.4
Loader, shovel type	161.5	161.5	153.9	+ 5.0
Specialized Machinery	**155.7**	**155.3***	**150.7**	**+ 3.3**
Ditcher	156.6	156.6	154.1	+ 1.6
Roller, tandem	209.8	209.8	193.2	+ 8.6
Roller, 3 wheel	174.9	174.9	161.6	+ 8.2
Ripper and rooter	150.5	150.5	143.3	+ 5.0
Dewatering pump, 10 M gph	110.0	110.0	111.7	- 1.5
Dewatering pump, 90 M gph	149.5	149.5	144.3	+ 3.6
Portable Air Compressors	**167.5**	**167.5**	**159.1**	**+ 5.3**
Contractor's Air Tools	**181.6**	**181.6**	**164.6**	**+10.3**
Mixers, Pavers, Spreaders	**156.2**	**156.4***	**150.1**	**+ 4.1**
Mixer, portable, 11 cu ft	165.0	165.0*	160.1	+ 3.1
Mixer, portable, 16 cu ft	169.8	168.9	163.1	+ 4.1
Mixer, truck, 6 cu yd	131.1	131.1	127.3	+ 3.0
Mixer, paving, 34 cu ft	193.5	193.5	185.2	+ 4.5
Concrete finisher & spreader	190.4	191.5	181.5	+ 4.9
Bituminous distributor	122.3	122.3	122.4	- 0.1
Bituminous spreader	170.2	170.2	160.3	+ 6.2
Bituminous paver	162.6	162.6	153.0	+ 6.3
Off-Highway Trucks, Wagons (b)	**101.1**	**101.1**	**99.9**	**+ 1.2**
Contractors off-highway truck (b)	101.1	101.1	99.9	+ 1.2
Trailer dump wagon (b)	101.4	101.4	100.0	+ 1.4

• a January, 1955=100 • January, 1958=100 *Revised
BLS Primary Market Price Indexes, U.S. Department of Labor. 1947-49=100

Steel Strike Begins to Hurt

The seven weeks of the steel strike through September 1 had little effect on availability of construction equipment. Orders were being filled pretty much on normal delivery schedules by all but a few manufacturers.

Exceptions included Thew Shovel, shut down by a strike of its workers who belong to the United Steelworkers Union. But Thew's production started up again late last month. Austin-Western was also hit by a strike.

Deliveries on some models of Harnischfeger equipment, especially truck cranes, have been stretched out since spring because of heavy demand. The steel strike had not affected deliveries as of Septemeber 1.

Most of the equipment industry stocked up on steel in anticipation of the strike. Some firms figure they have enough steel to keep production humming through October. But there's worry about suppliers running out of steel, thus curtailing equipment shipments because component parts are not available.

New orders for construction and mining machines edged upward in July to set a new record for the month. The index was 330, based on 1949=100, according to the McGraw-Hill Department of Economics. This is a shade above June's index of 329 and 26% higher than a year ago. Record order volume in the first seven months of 1959 is a thumping 31% higher than last year.

Contractors' new business dropped off more than is usual in August, after three months of very high volume. The contract award index of 238, based on 1949=100, is 8% under August of last year largely because of a slump in highway contracts.

POWERGRIP "TIMING" BELT

Why Reo's new ready-mix truck *(with a flywheel power take-off)*

...is equipped with PowerGrip "Timing" Belt

Reo's* new transit mix truck has a revolutionary new flywheel power take-off. This does away with a separate engine or a take-off from the front end to truck engine crankshaft. Reo's take-off is factory designed, and engineered and installed as an integral part of the chassis engine drive. It is at the rear of the engine, ahead of the transmission. Only U. S. Rubber's PowerGrip "Timing"® Belt can deliver the positive, smooth, direct, even-flowing power desired by Reo's engineers. PowerGrip "Timing" Belt eliminated the need for lubricants and the possibility of oil leaks. This positive drive belt is an essential, functional part that helps bring to the transit mix operator a payload increase from 400 to 600 lbs. per trip.

The efficiency and the freedom from maintenance that U. S. Rubber's PowerGrip "Timing" Belt has brought to this new revolutionary Reo drive has been demonstrated repeatedly on original equipment and replacement drives. Your U. S. Rubber distributor and "U. S." transmission engineers stand ready to help you with any transmission replacement or design problems.

*Div. of White Motor Co., Lansing, Michigan

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

D6 builds mountain road to Portland Reservoir

Portland, Oregon, gets its supply of pure, soft mountain water from the Bull Run River . . . 30 miles east of the city. The river has its source in Bull Run Lake near the summit of the Cascades . . . elevation 3,175 feet. The uninhabited, 218-square-mile area is heavily-timbered, rugged terrain. To repair a dam at Bull Run Lake required carving out 5 miles of new road.

A Caterpillar D6 Tractor with a No. 6A Bulldozer and a Hyster donkey did the job . . . rough grading, ditching, clearing boulders, skidding logs, spreading crushed rock. All this plus general maintenance jobs such as winching logs from the lake and river.

The versatile D6 outworks any tractor in its size range. It combines high production with low operating and maintenance costs.

The 93 horsepower Caterpillar Engine delivers the push and pull to make the hard work easy; the engine's foul-proof fuel system runs on economy-type diesel fuels.

The D6 is fast . . . speeds up to 6.6 MPH . . . and easy to operate. A hydraulic unit takes the effort out of steering, helps the operator work at top efficiency.

The exclusive Caterpillar oil clutch goes up to 2,000 hours—one whole season—without adjustment. When other type clutches need *replacing*, a Caterpillar oil clutch may need an *adjustment*.

All of these features on the D6 combine to give you a profitable return on every dollar invested. And for added versatility . . . there's a complete line of attachments for the D6.

You could be missing out on a machine valuable to your operation. A demonstration on your job will show you why the D6 is the work horse on so many earthmoving jobs. Call your Caterpillar Dealer soon. He'll give you the full story . . . top production facts and figures.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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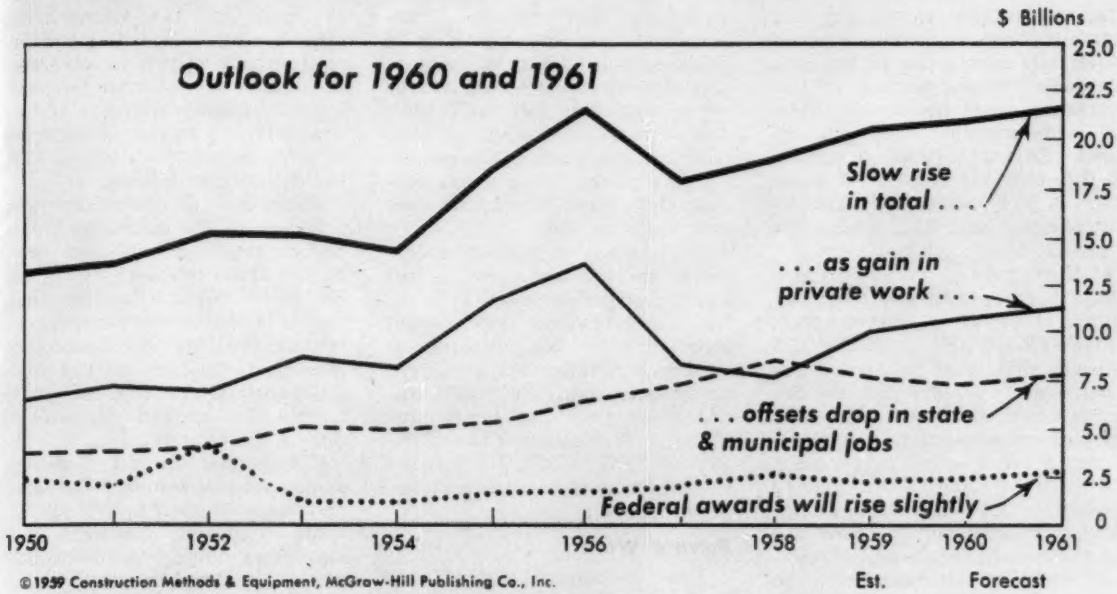
HIGH-QUALITY MACHINES WITH A LOW FINAL COST



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Future Business Looks Good

NEW BUSINESS for contractors will keep rising through 1961 with increasing private construction taking up the slack in state and local public works awards. That's the *CONSTRUCTION METHODS* forecast for the next two years.

Heavy construction contracts probably will rise 3% in 1960 to $20,825 million. This is on top of 1959's estimated increase of 6% to a total of $20,300 million. 1961 contract volume may hit $21.6 billion. This would be 7% more than 1959 and 4% more than the forecast for 1960. But 1961 will still be a shade below 1956's all-time high of $21.7 billion.

Among major types of construction, the big gainers next year will be industrial building, up 33% on top of an estimated 65% jump this year; commercial building, up 11%; and waterworks, up 12%. Increases are also forecast for sewerage, up 7%; and earthwork-dams-waterways, up 6%. It will be up to these five major types of work to lift the coming year's new business above this year's level.

While total volume is expected to be up next year, the rate of increase will be less than this year because the postwar boom in public works is fading. State and municipal construction awards this year are going to drop 9% under last year's all-time high, according to the *CONSTRUCTION METHODS* estimate. And a further decline of 6% is forecast for 1960.

The state and local public works market has turned soft for two reasons:

• Highway and bridge construction contracts have slipped because of inadequate federal financing.

Unless Congress provides the revenues needed to sustain the interstate highway program at its previously authorized rate, a cutback in interstate contracting appears inevitable for the fiscal years 1960, 1961, and 1962. In

Forecast: Heavy Construction Contract Awards

Reported by Construction Methods (millions of dollars)

Type of Work	1958 Actual	1959 Estimate†	1960 Forecast	Change '59-'60 %	1961 Forecast	Change '60-'61 %	Change '59-'61 %
ALL HEAVY CONSTRUCTION	19,165	20,300	20,825	+ 3	21,620	+ 4	+ 7
OTHER THAN BUILDING	8,210	7,750	7,810	+ 1	8,390	+ 7	+ 8
Waterworks	306	425	475	+12	475	0	+12
Sewerage	618	675	725	+ 7	765	+ 6	+13
Bridges	714	800	725	— 9	650	—10	—19
Highways	3,729	3,300	3,000	—10	3,200	+ 7	— 3
Earthwork-Dams-Waterways	1,045	800	850	+ 6	1,050	+24	+31
Unclassified, Public*	1,369	1,300	1,410	+ 8	1,500	+ 6	+15
Unclassified, Private‡	429	450	625	+39	750	+20	+67
BUILDINGS	10,955	12,550	13,015	+ 4	13,230	+ 2	+ 5
Private Mass Housing	3,739	4,400	3,900	—11	5,100	+30	+16
Commercial	1,795	2,250	2,500	+11	2,600	+ 4	+16
Industrial	1,756	2,900	3,850	+33	2,700	—30	— 7
Public Nonresidential	2,610	2,400	2,300	— 4	2,400	+ 4	0
Housing	1,055	600	465	—22	430	— 8	—28

*Mainly airports, missile bases, tunnels.
‡Mainly pipelines, transmission lines
†Based on first 7 months actual, estimated 5 months.

fact, about three out of every four state highway departments halted interstate contracting or bid calls in recent weeks because of uncertainty about how much federal reimbursement they can expect. August highway contracts fell to only $51 million per week. This is 29% below July's weekly average and 45% under the August record, set last year.

• New public works projects have been moving into the planning stage at a slower pace. *CONSTRUCTION METHODS* figures show that this trend began as early as 1956. But the decline was gradual until 1958 when it took on proportions that indicated a break ahead in the public works boom. This decline halted a few months ago, but there's no evidence of a new rise in the making. State and municipal contracts will continue on the downgrade because it takes two years or more for the average project to pass through the planning stage to construction.

Though there's a huge volume of highway and bridge construction in the planning stage, lack of financing will hold up many projects. Highway awards may not recover from this jolt until 1961.

Waterworks and sewerage construction stand out as the brightest spots in the public works outlook. Both types of work may set new highs in 1960.

California, the biggest waterworks construction state, is just starting on its proposed $1.7-billion water resource development program; the big upsurge in awards in California won't come unless and until the voters approve the necessary bond issue at the 1960 election. (The *CONSTRUCTION METHOD* forecast assumes that the voters will approve the bond issue.)

Private Work

The construction market outlook for 1960 and 1961 is brightest for private projects. *CONSTRUCTION METHODS* forecasts a 9% rise in private awards next year, on top of this year's 29% gain. And 1961 should bring a further increase, lifting the annual volume of private contracts 12% above the estimate for 1959.

The current rebound in industrial building awards is expected to continue next year with a 33% increase to $3.9 billion.

Sharp ups and downs are characteristic of the industrial building market. Next year's rise probably will be followed by a 30% decline in 1961 to a little less than the 1959 estimated total. That's because the 1959-60 expansion in industrial contracts should push up industrial capacity enough to handle the growth in demand during the next few years.

Commercial building awards should set a new high this year—and again in 1960 and 1961.

Mass housing contracts will slow down during the second half of this year, and the decline may continue through 1960. A tightening supply of mortgage credit will account for the decline in mass housing contracts.

continued on page 52

STANG LOWERS THE WATER TABLE 20 FT. IN −15° WEATHER

Sub-zero weather, yet business as usual—thanks to the reliability of a Stang Wellpoint System. In any weather, under all conditions, you can depend on Stang engineered dewatering systems. Call on the John W. Stang Corporation next time you have a dewatering problem. They're first in engineering, first in equipment, and first in service.

PROJECT: STORM DRAINS FOR MINNESOTA STATE HIGHWAY DEPT., BLOOMINGTON, MINNESOTA. CONTRACTOR: BARBAROSSA & SONS, INC., ST. CLOUD, MINN.

JOHN W. **STANG** CORPORATION

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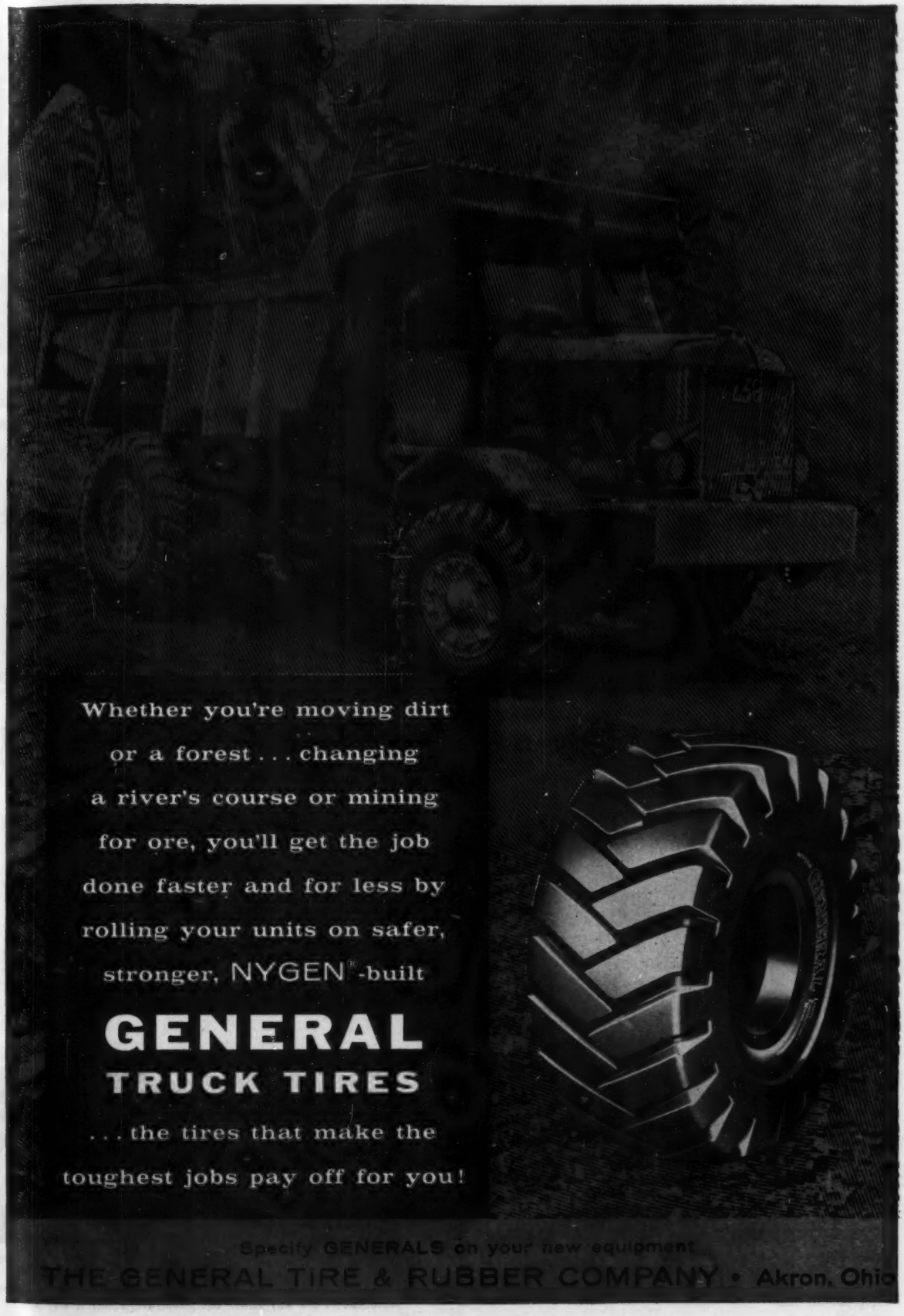
Whether you're moving dirt
or a forest . . . changing
a river's course or mining
for ore, you'll get the job
done faster and for less by
rolling your units on safer,
stronger, NYGEN®-built
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Specify GENERALS on your new equipment
THE GENERAL TIRE & RUBBER COMPANY • Akron, Ohio

ISBELL TURNS TO TORQMATIC

to get new U.S. Highway #40

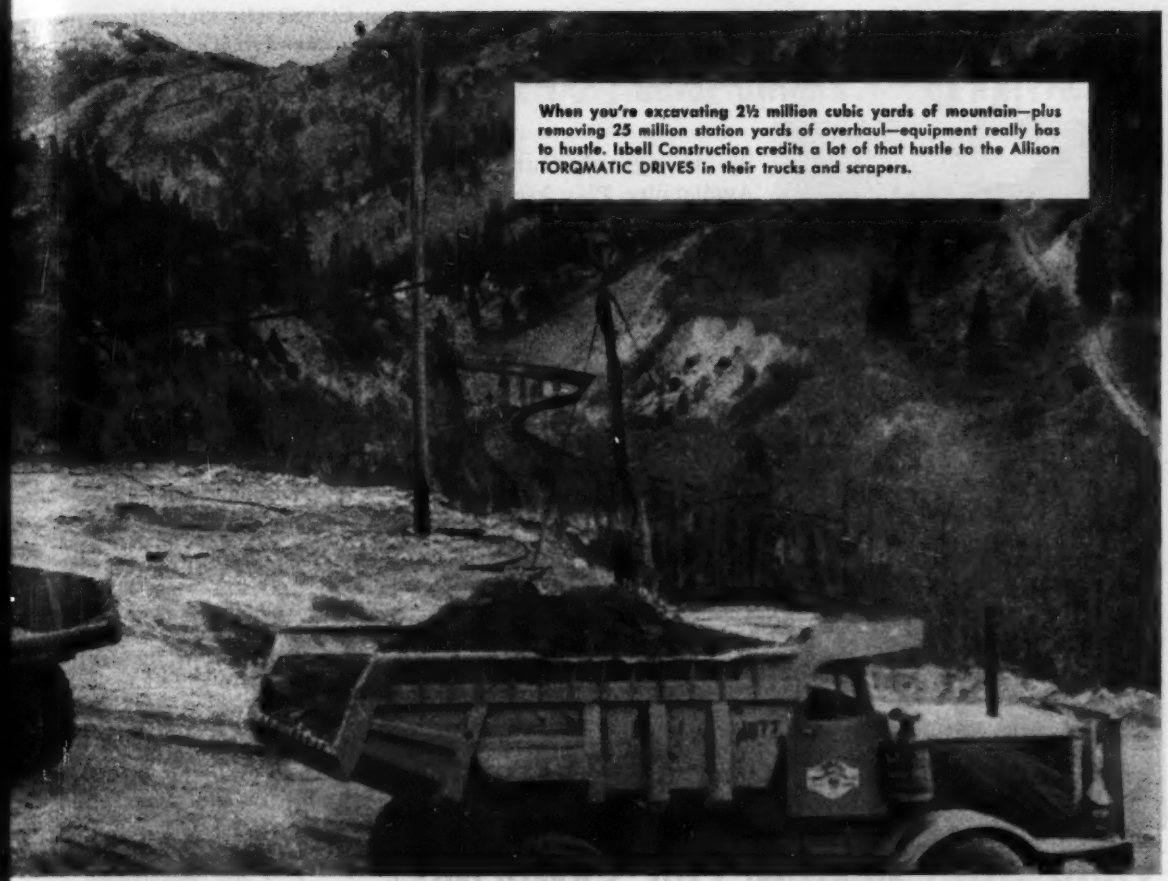
Effortless gear selection—with just a flick of the TORQMATIC selector lever—makes for safer, more alert driving. With TORQMATIC equipment even Isbell's "greenest" drivers become safe, competent drivers.

Isbell Construction Company of Reno, Nevada, has turned loose their TORQMATIC DRIVE equipment on many a big job. But none bigger – or tougher – than cutting away 2½ million yards of Sierra Nevada mountain as roadbed for the new U. S. Highway #40 link—thru route to the 1960 Winter Olympics at Squaw Valley, California.

A whole army of TORQMATIC-equipped Euclid TD trucks plus S-18 and S-24 scrapers are on the site. Their assignment: helping excavate the 6.7 miles of mountainside—

Climbing back and forth out of the "hole" is tough on any truck. But TORQMATIC equipment takes all the downgrades with practically no wear on the service brakes. A built-in TORQMATIC retarder handles most all braking except for full stops.

When you're hauling over boulder-strewn terrain like this, your truck needs all the protection it can get. Isbell Construction's "Eucs" get it from the fluid coupling in their TORQMATIC DRIVES. Result: drive-line replacements are way down—equipment availability is way up.



When you're excavating 2½ million cubic yards of mountain—plus removing 25 million station yards of overhaul—equipment really has to hustle. Isbell Construction credits a lot of that hustle to the Allison TORQMATIC DRIVES in their trucks and scrapers.

completed by '60 Olympic Game time

AND hauling out 25 million station-yards of overhaul that's loaded throughout with hefty granite boulders. Yet Isbell is running ahead of schedule on this mountainous job. And they give full credit to their TORQMATIC "Eucs." Even "green" drivers have rapidly become professional, thanks to foolproof TORQMATIC operation.

Phenomenally high equipment availability has been another real timesaver. Drive-line replacements have been cut back. And there've been comparable savings on service brakes—thanks to the built-in retarder.

"No matter what kind of job we're on—building airports, superhighways or even working open pit mines—we know we can count on our TORQMATIC equipment," declares President C. V. Isbell.

Wouldn't you, too, like to handle record jobs—in record time—at record profits? Check into timesaving, money-saving TORQMATIC DRIVES for your operation!

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana
In Canada, contact GENERAL MOTORS DIESEL LIMITED, London, Ontario

Allison TORQMATIC

TORQMATIC® DRIVES

NOW–AIR TOOLS WHEN NEEDED

Worthington's Guaranteed Availability Plan keeps a full complement of tools on the job even if some are in the shop for checkup or repair. All you do is: 1) bring your hand-held Blue Brute air tool to your Worthington distributor. 2) While it's in his shop he will lend you another tool.

See your nearest Worthington distributor for complete details about the Guaranteed Availability Plan. Worthington Corporation, Holyoke, Massachusetts.

60-16

WORTHINGTON

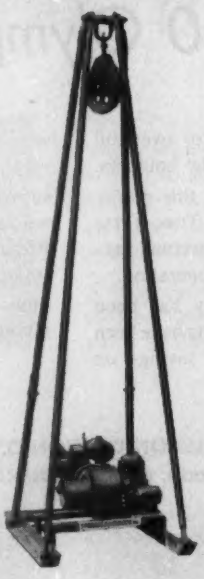
YOUR FIRST NEED IN SOIL SAMPLING

AN

S&H **PIPE DRIVING WINCH**

INEXPENSIVE • LIGHTWEIGHT • ECONOMICAL

A Sprague & Henwood pipe driving winch is your first requisite for normal soil sampling operations. For shallow holes there is the Model PD, and for the deeper holes, the more rugged Model PDH. Both models are furnished with a tubular steel derrick with telescoping rear legs permitting 10' pulls. In addition to the skid mounting, there is also available a special trailer mounting that permits operation of the unit as either a skid or trailer-mounted unit. Write today for full particulars. Ask also for Bulletin #300 which illustrates and describes the complete S & H soil sampling line.



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CONSTRUCTION BUSINESS . .

continued from page 48

As the industrial building upturn hits full stride next year, businessmen will take increasingly large amounts from the capital markets. This will accentuate the homebuyer's difficulty in obtaining a government-insured mortgage loan. With lenders more sparing in their FHA and VA mortgage loan commitments, the 1960 mass housing market probably will slide 11% below this year's volume. However, a 1961 drop in industrial building might trigger a brisk recovery in the mass housing market by easing the mortgage credit squeeze.

More Federal Work

Federal construction contracts are likely to reverse the 1959 decline next year. Thus federal work will add its weight to expanding private work in taking up the slack in state and municipal public works.

This year's drop in Capeheart military housing contracts is the major factor in the federal awards decline. But this factor will wash out in 1960. Then, the more or less steady rise since 1954 in federal projects entering the planning stage should take hold and bring increasing federal construction contracts in 1960 and 1961.

SOME BIG CONTRACT AWARDS OF THE MONTH

Guy F. Atkinson Co., and Ostrander Construction Co., 10 West Orange Ave., San Francisco, Calif. A joint venture to construct powerhouse superstructure and surge tank bases at the Oahe Reservoir near Pierre, S. D. Corps of Engineers, 1709 Jackson St., Omaha 2, Neb. $19,367,462.

George A. Fuller Co., 111 W. Washington St., Chicago, Ill. Erect an office building at Jackson and La Salle Sts. in Chicago, Ill. National Property, Inc., 200 S. Michigan Ave., Chicago, Ill. $16,000,000.

The Foundation Co., 39 Broadway, New York, N.Y. Construct an underground parking garage in Boston, Mass. Commonwealth of Mass. Parking Authority, 44 School St., Boston, Mass. $15,000,000.

Special report to Caterpillar D8 Tractor owners:

CAT CATERPILLAR

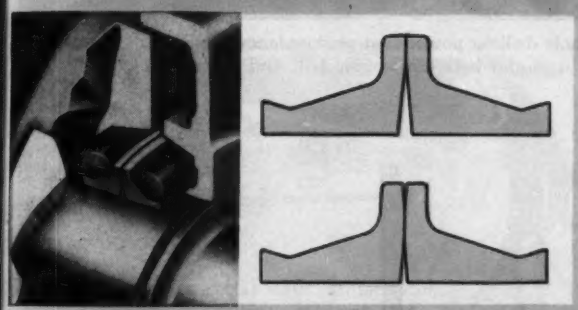
Parts you can trust.
Dependable round-the-clock service.

NOW—YOU CAN EQUIP YOUR D8 WITH LIFETIME LUBRICATED ROLLERS

AVAILABLE FOR 2U, 13A, 14A AND 15A MODELS

Forget about lubrication . . . and seal replacement. They're eliminated by this new concept in roller design and performance. The new lifetime lubricated rollers are lubricated when installed on your tractor. They'll never need lubrication until the rollers are disassembled for rim and flange rebuilding. The seals do not leak even after thousands of hours of operation. Seals won't need replacement when rollers are rebuilt. Another advantage—*oil* lubricant rather than grease is used because oil dissipates heat faster. Rollers operate at cooler temperatures. Bearings last longer.

New floating ring seal . . . wear does not decrease efficiency. The roller seal employs two metal alloy and two rubber "O" rings. The metal rings, much harder than file steel, have



lapped faces . . . smoother than glass. These faces taper slightly toward the inner edge forming a sealing area at the outer edge. As wear occurs, the sealing area moves inward, maintaining a perfect seal through thousands of hours.

The "O" rings keep constant pressure on the metal rings. Lubricant can't get out. Grit can't get in. There are no springs or diaphragms to weaken, wear or become damaged. "O" rings are made of special compound to resist oil, heat and cold.

Millions of hours of proof—the toughest track roller yet. Cat lifetime lubricated rollers have been subjected to extensive and exhaustive on-the-job tests *for over 5 years*. Working under all types of job conditions, these time-tested rollers have proven unequalled. Their success is further amplified by new machine owner reports—for low-cost performance and minimum maintenance, Cat lifetime lubricated rollers can't be beat.

Easy installation is achieved by use of snap rings to hold the seals and end collars in position before mounting. End collar bolt holes will line up easily with track roller frame holes during installation.

Stop track roller greasing now with these lifetime lubricated rollers. See your Caterpillar Dealer. He will give you the complete story on this time-saving, money-saving undercarriage component.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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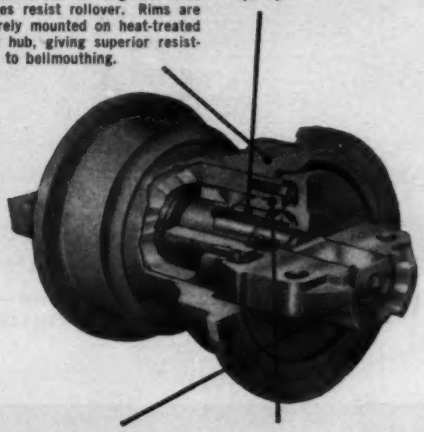
MANY OTHER NEW FEATURES THAT EXTEND TRACK ROLLER LIFE

RIMS — made from forged steel. Deep-hardened for long life. Wide flanges resist rollover. Rims are securely mounted on heat-treated steel hub, giving superior resistance to bellmouthing.

BEARINGS have high load carrying capacity.



LARGE DIAMETER SHAFT is double heat treated, making it extra stiff and resistant to wear.

BUSHINGS contain large oil reservoirs for more lubricant and better cooling.

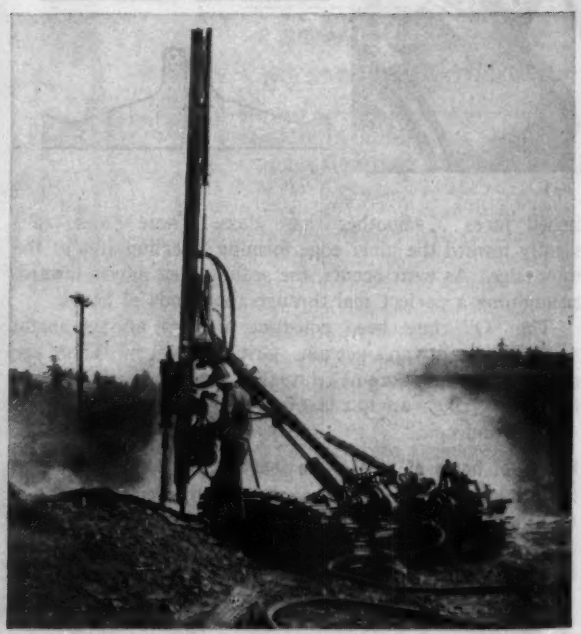
SERVICE TIP: When rebuild time finally comes, be sure to keep the metal rings matched in original pairs, being careful not to nick or mar the lapped faces.

HARD-HITTING DRILLS

THE SIZE, THE POWER AND

5 ½" hammer diameter—Here's deep hole drilling power that packs plenty of punch. Gardner-Denver DH143 fills the rock drill gap between wagon drill and rotary rig.

Tough and long-lasting—Gardner-Denver drill steel. Emergence from heat-treat furnace shows carburizing process that results in abrasive-resistant exterior and tough inner core.



First choice in crawler drills—The versatile swing-boom "Air Trac"®. Now available in a variety of models including stiff- and swing-boom units with complete hydraulic components.

FOR ANY ROCK BLAST

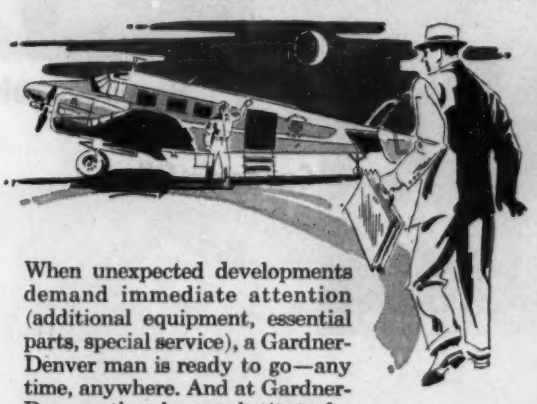
THE SPEED YOU NEED

Select your rock drills from the most complete line of drifters in the field . . . GARDNER-DENVER

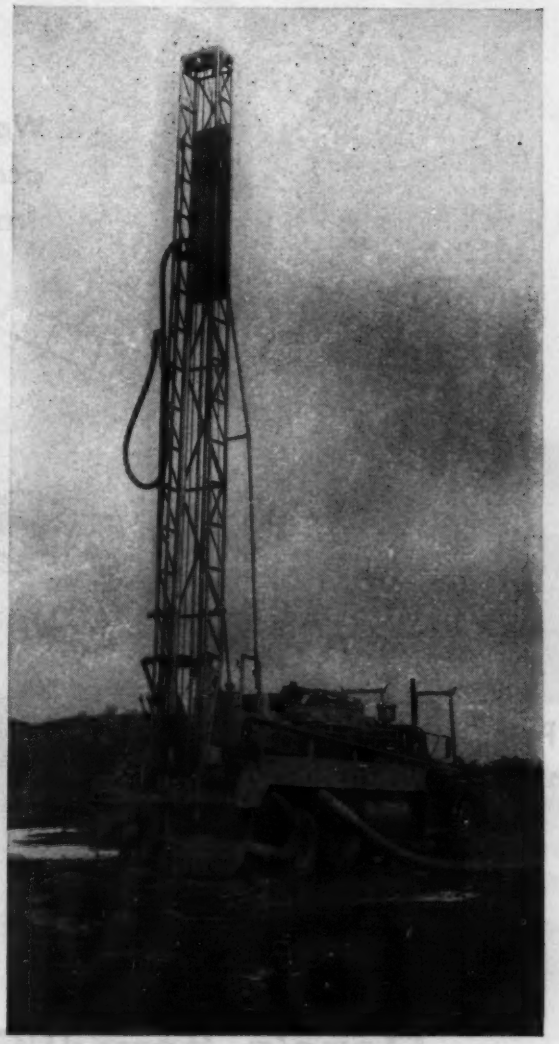
Gardner-Denver offers the most complete range of drifter drills known, thus assuring the right drill for your application, regardless of what it may be.

Talk to a Gardner-Denver blast hole specialist before you buy new rock drills. His experience can help you select the best blast hole plan and the right equipment for the job from Gardner-Denver's complete line of drills, rigs, steel and accessories.

MIDNIGHT MISSION



When unexpected developments demand immediate attention (additional equipment, essential parts, special service), a Gardner-Denver man is ready to go—any time, anywhere. And at Gardner-Denver, there's no substitute for men—our 100-year philosophy of growth.



In-the-hole power for rotary rigs—New Gardner-Denver "Mole-Dril"* rides with the bit through rock . . . delivers more striking power than any other drill of its size.

GARDNER-DENVER Since 1859 — 100 1959 YEARS

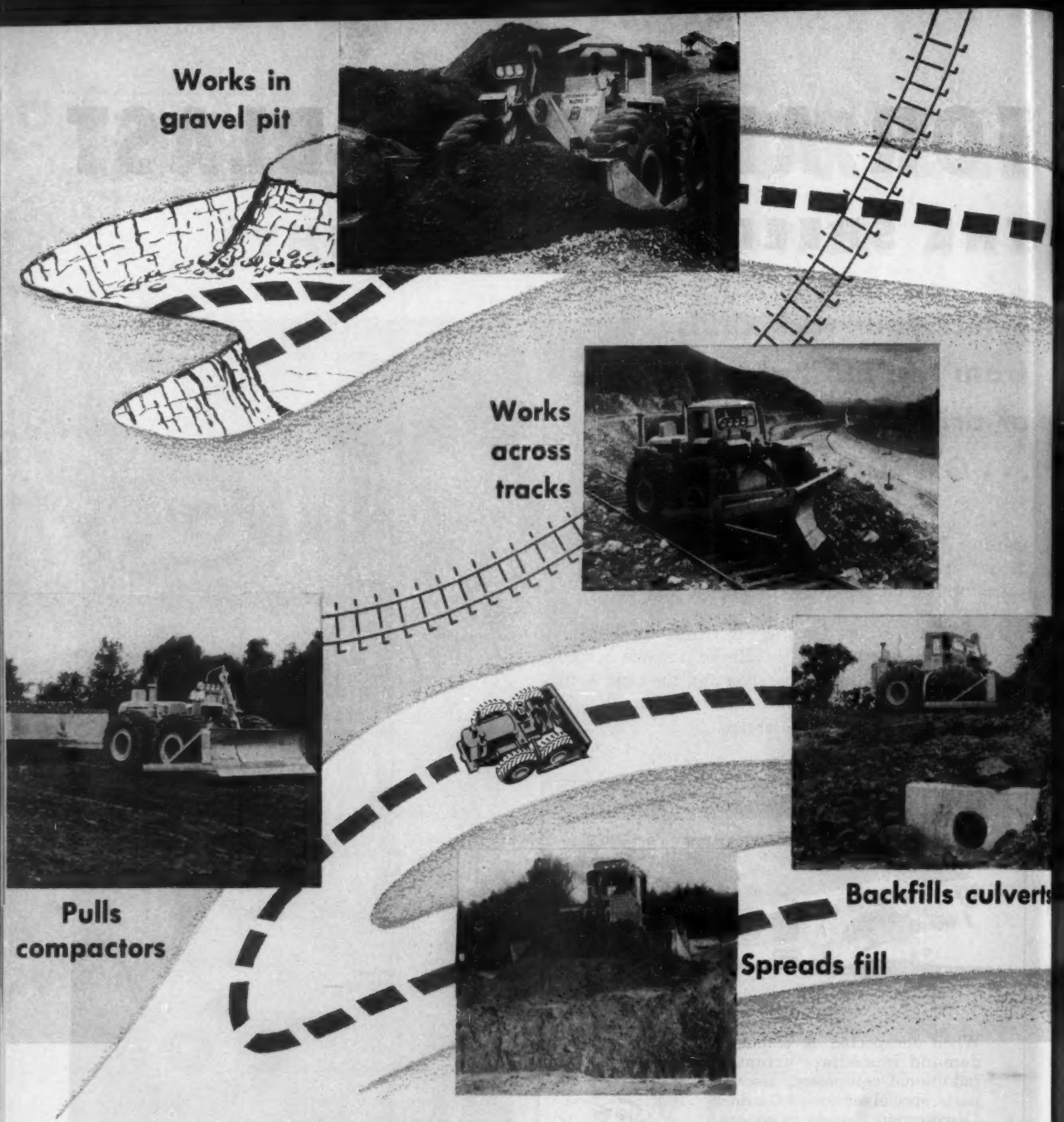
EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

*Trade-Mark



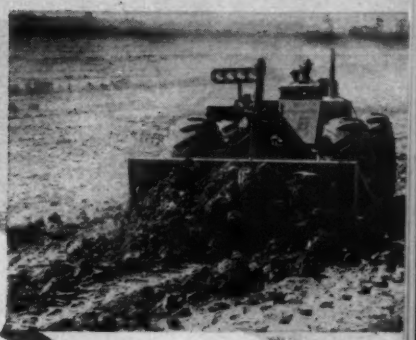
Here's how TOURNATRACTOR® puts extr

RUNS from one assignment to another, at speeds to 17.2 mph. Travels anywhere, without "piggy-back" assistance.

Handles more tractor jobs over a wider area...faster

Because of its rubber-tired *speed* . . . *power* . . . and *mobility* . . . Tournatractor gets around the job *fast* . . . often does the work of 2 or 3 slow-moving crawlers. You need *fewer* tractors on your spread when you work a Tournatractor . . . and the saving is *yours.*

Cleans up
haul road



Cleans up
in borrow pit

Push-loads
scrapers

Pulls scrapers

Cleans around shovels

Fills-in
washes

extra dollars in your pocket!

Get the full story on 218-hp Tournatractor from your LeTourneau-Westinghouse Distributor. He will be happy to arrange a demonstration so you can see the profit-possibilities for you in this fast, rubber-tired, heavy-duty tractor. Meantime, send for your copy of our all-new 16-page Tournatractor data book.

CT-2197-DC-2

LW

Where quality is a habit

LETOURNEAU-WESTINGHOUSE COMPANY
PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

YOU'LL SAVE MONEY
FOR YOUR COMPANY, TOO!

Earnest specializes in fasteners for construction equipment... **heavy duty** fasteners for **heavy duty** SERVICE. CAP SCREWS to 20" length; NUT diameters to 6". GROUSER STEEL for all sizes of track, cut to length, if required. TRACK SHOE BOLTS AND NUTS, PLOW BOLTS, STUDS, RODS, WASHERS, COTTERS, ETC. Look for the "Black Diamond" Mark of Quality when you want the very best your money can buy, at a price no higher than inferior grades.

EARNEST MACHINE PRODUCTS CO.

12716 Triskett Road, Cleveland 11, Ohio

Telephone
WINTON 1-4000
Out-of-Town Toll
Calls Accepted

ALL STOCK ORDERS FILLED AND SHIPPED WITHIN 48 HOURS . . . TO ANYWHERE IN THE WORLD!

Cape Constructors' D 'Pull operator, Steve Yaremp, says units are "fine for work on housing jobs. Electric controls are simple to operate and the machines are a cinch to maneuver."

LW earthmovers speed start of air base housing project

Construction of an urgently needed second 500-home military housing project at Dover Air Force Base, Del., was given a fast start by Hart Constructors of Dover. A joint venture made up of Terminal Construction Corporation of Wood-Ridge, New Jersey and Frouge Construction Co., Inc. of Bridgeport, Conn.—largest builders of military Capehart housing in the nation. The firm handled site preparation with five high-speed LeTourneau-Westinghouse earthmovers—four 29.5-mph D Tournapulls® and a 26-mph LW Adams* 660 motor grader.

On cycles about a mile long, the four 143-hp 'Pulls* averaged a total of 50 loads of gravel per hour. Material was spread as base for temporary construction buildings and parking lots. The 160-hp grader ranged the spread, cutting and maintaining haul and access roads and smoothing scraper-spread gravel on the fill in its spare time.

"Practically no lost time"

Administrator Jack Chasin reports that the dependability of the "660" and D 'Pulls was outstanding, and a real help in keeping the operation on schedule. "There was practically no lost time for repairs," he says, "and operating costs were low."

High-speed LW units can cut your costs, too. See the heavy-duty "660" grader and high-production D Tournapull at work. Ask for a demonstration.

"It's easy to keep ahead of scrapers on the fill with this grader," reports John Ratledge, operator of Cape Constructors' Adams 660. "It's got plenty of power, easy handling controls, and I have a good view of the blade all the time."

*Trademark GDP-2035-DCJ-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

all-new 365-cfm GYRO-FLO

...a heavy-duty portable compressor with MORE POWER and MORE PERFORMANCE

Ingersoll-Rand, the pioneer builder of portable rotary compressors, now offers a completely new size Gyro-Flo portable—the DR-365. This rugged, all-new compressor provides 365 cfm of mobile air power—16% more than its predecessor, the Gyro-Flo 315. Yet, the DR-365 is no bigger than the 315 cfm Gyro-Flo, and its larger, more powerful engine retains the same 1800 RPM speed.

Take a closer look at what this all-new compressor offers: A new, simplified, more-efficient compressor system with...automatic drainage of oil from cylinders when the unit is shut down...dependable Air-Glide capacity control for 100% stepless regulation...a 12-volt battery system for faster, easier starting... side covers that fold back safely out of the way... a full-length, large capacity tool box to provide extra storage space...all operating controls, fuel tank, filters and tool storage enclosed by lockable side covers. These are just a few of the many features that mean more power, better performance, and greater convenience and safety, too.

The Gyro-Flo 365 is powered by the GM 4-71, 4-cylinder diesel engine. The Gyro-Flo 365 has a heavy-duty, spring-mounted running gear with automotive-type steering—every part built to withstand the hard service encountered on construction jobs. And remember, Ingersoll-Rand's Gyro-Flo line is complete ...six sizes that have become first choice among performance- and economy-minded construction men.

Ask your Ingersoll-Rand representative for complete information or send today for Bulletin 2932.

DIMENSIONS AND WEIGHTS	DR-365 with Diesel Engine
4-WHEEL MOUNTING	
Weight (dry)	5939
Weight (wet)	6640
Length (less drawbar)	10′ x 5¾″
Width	5′ x 8″
Height	6′ x 10½″
Track	56
LESS RUNNING GEAR	
Weight (dry)	5279
Weight (wet)	5980
Length	10′ x 2⅞″
Width	4′ x 9½″
Height	5′ x 2¾″

Ingersoll-Rand
2-959 11 Broadway, New York 4, N.Y.

AN UNBEATABLE COMBINATION...GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

Top money-maker on big-volume jobs — that's the 360-hp B Tournapull with 28-yd Fullpak scraper. Weight tests taken throughout the country prove the "Big B" hauls more of its rated capacity than any other competitive scraper.

They're buying the BIG ones!

NOW, as never before, contractors are up-grading their earthmoving fleets with *big* high-speed self-propelled scrapers. And no wonder — with the demand for faster completion of highways — there are *more* big-yardage, *big-profit* jobs available.

And the LeTourneau-Westinghouse 360-hp B Tournapull® with 28-yd Fullpak® scraper is the machine that gives contractors more of everything they want . . . excellent production, dependability, maneuverability . . . ease of operation . . . and low-maintenance costs.

The Big B 'Pull* gives you all these money-making benefits because it has more high-speed dirtmoving features than any competitive unit. You get, for example, the world's fastest-loading scraper . . . the *Fullpak*. There's the LW *power-transfer differential* . . . which keeps your machine working in softest going. You get exclusive *electric controls* . . . fast-acting, easiest of all control systems to maintain. And you have a *choice of transmissions* — step gear or power shift — to match the machine to your type of work.

Visit your nearby LeTourneau-Westinghouse Distributor . . . let him give you detailed specifications on the LW "Big B". Tell him you'd like to see it in action. Call on him soon!

Another train load of B 'Pulls rolls out of the LW plant at Peoria, Ill. These 8 "B's" will put their owner — C. P. Minnaert, of Cuba City, Wisconsin — in a top competitive position on big-yardage work. The contractor who owns modern, high-production equipment is in position to complete more work on time, and make bigger profits.

*Trademark BP-2127-DC-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Now SKF has improved the spherical roller bearing it invented!

This new spherical roller bearing offers even higher capacity than SKF's original, self-aligning bearing – and meets the needs of today's faster, more productive machinery. In some cases, the increase in capacity is as much as 54% – corresponding to more than 4 times longer service life!

Here's how these improvements have been obtained:

1. Eliminating undercuts and integral flanges – helps provide space for larger rollers and longer effective contact between rollers and races.

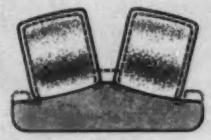


Fig. 1

Fig. 2

2. Using symmetrical rollers, unrestricted by flanges – ensures uniform load distribution over the roller length at all times, even under heavy thrust load.

3. Using an axially floating guide ring – provides effective roller guiding, and minimizes friction at roller ends.

Fig. 3

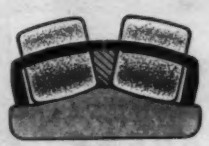


Fig. 4

4. Using a strong "window-type" cage for each row of rollers–helps ensure dependable operation over a full range of loads and speeds.

5. Placing a lubricant duct in the center of the outer ring–helps channel lubricants directly to the rollers and push contaminants away.

Fig. 5

For full details on this new high-capacity spherical roller bearing call the nearest SKF sales office or authorized SKF distributor listed in the yellow pages of the telephone book.

5931

Spherical, Cylindrical, Ball, and Tyson Tapered Roller Bearings

EVERY TYPE–EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U. S. PAT. OFF.

Now! An Official Size Portable Warning Light . . .

No. **680** 12-Volt

DIETZ Visi-flash

Big 8" Lens gives long distance hazard-warning in

HIGH-SPEED AREAS

Use the 680 Visi-flash to give drivers on high speed highways the lead-time needed to slow down for dangerous hazards ahead. The Traffic Signal size 8" lens and the highly polished parabolic reflector are precisely combined to uniformly beam hazard warnings over the longer distances and areas necessary to slow high speed traffic.

Powered by two 6 volt batteries, the fully transistorized 680 has no tubes to fracture, jar loose, or burn out. The entire unit is proof against weather, shock, rough treatment. In the standard circuit, batteries deliver dependable performance for *650 hours!*

Dietz 680 Visi-flash

Warning Light of Many Uses

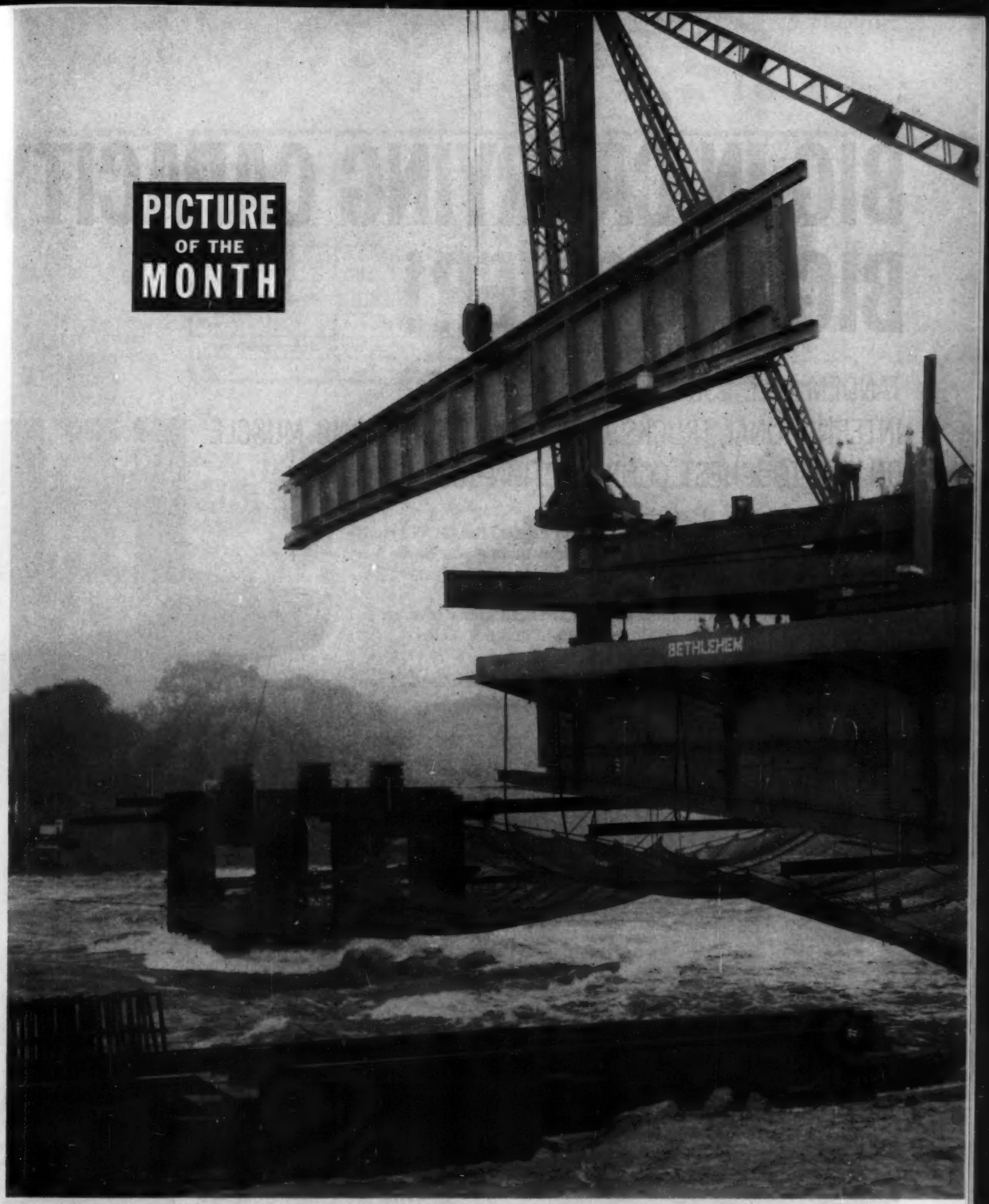
- **High-speed hazard warnings**
- **Semi-permanent barricades**
- **School crossings**
- **Police warnings**
- **Abutment markers**
- **Overpass markers**
- **River bridge markers**
- **Rural traffic islands**

Ask your Certified Dietz Distributor in the U.S.A. or Canada for complete information. Or write for full line catalog: R. E. Dietz Co., 103 Leavenworth Avenue, Syracuse 1, New York.

New 685 Visi-flash EMERGENCY LIGHT

The 685 Visi-flash is especially designed for all kinds of warning lighting in emergencies, e.g., fires, roadblocks, work areas, maintenance or temporary hazardous road conditions in bad weather. Featuring a big 8" lens, it is powered by two 9 volt hotshot batteries – can be mounted on tripod up to 8 ft. high (available on order).

Go DIETZ and you go Safely



Bridging in Rough Water

• Stiffleg derrick lifts a 59-ton girder 96 ft long out over the swirling waters of the Niagara River and places it on temporary falsework of piles driven to rock. Bethlehem Steel Co. is erecting the superstructure of the American Rapids Bridge a short distance above Niagara Falls. The 450-ft arched main span will be the longest continuous plate girder span in the Western Hemisphere. With two 70-ft anchor spans, total length of the bridge will be 590 ft.

BIG IN CARRYING CAPACITY! BIG IN POWER!

TANDEM-AXLE 230-SERIES INTERNATIONAL TRUCKS GIVE YOU NEW WORKING MUSCLE ON THE TOUGHEST CONSTRUCTION JOBS!

Built for 60,000 lbs. GVW . . . up to 125,000 lbs. GCW! Here's brawn that extends from rugged channel iron bumper, to frame cut-off. Double channel, heat-treated side rails have a high combined section modulus of 25.74, use extra-heavy-duty cross-members for uncompromising frame strength under severest torsional stress. Axles up to 15,000 lbs. in front and 60,000 lbs. at rear take mammoth loads where there are no roads.

Power to match! Diesel engines up to 260 hp. (695 lb.-ft. of torque) are scientifically engineered with a range of four, five or 10-speed transmissions to give you a power train that assures optimum operation under all load and grade conditions. New power and muscle to tackle and handle all jobs, speed up "fill-in" and "carry-away" operations, make more money from more jobs . . . as sure as you're in the construction business!

Try 'em for all they're worth!
See your INTERNATIONAL Dealer about testing these tough looking, tough built 230-series INTERNATIONAL Trucks on your job, today!

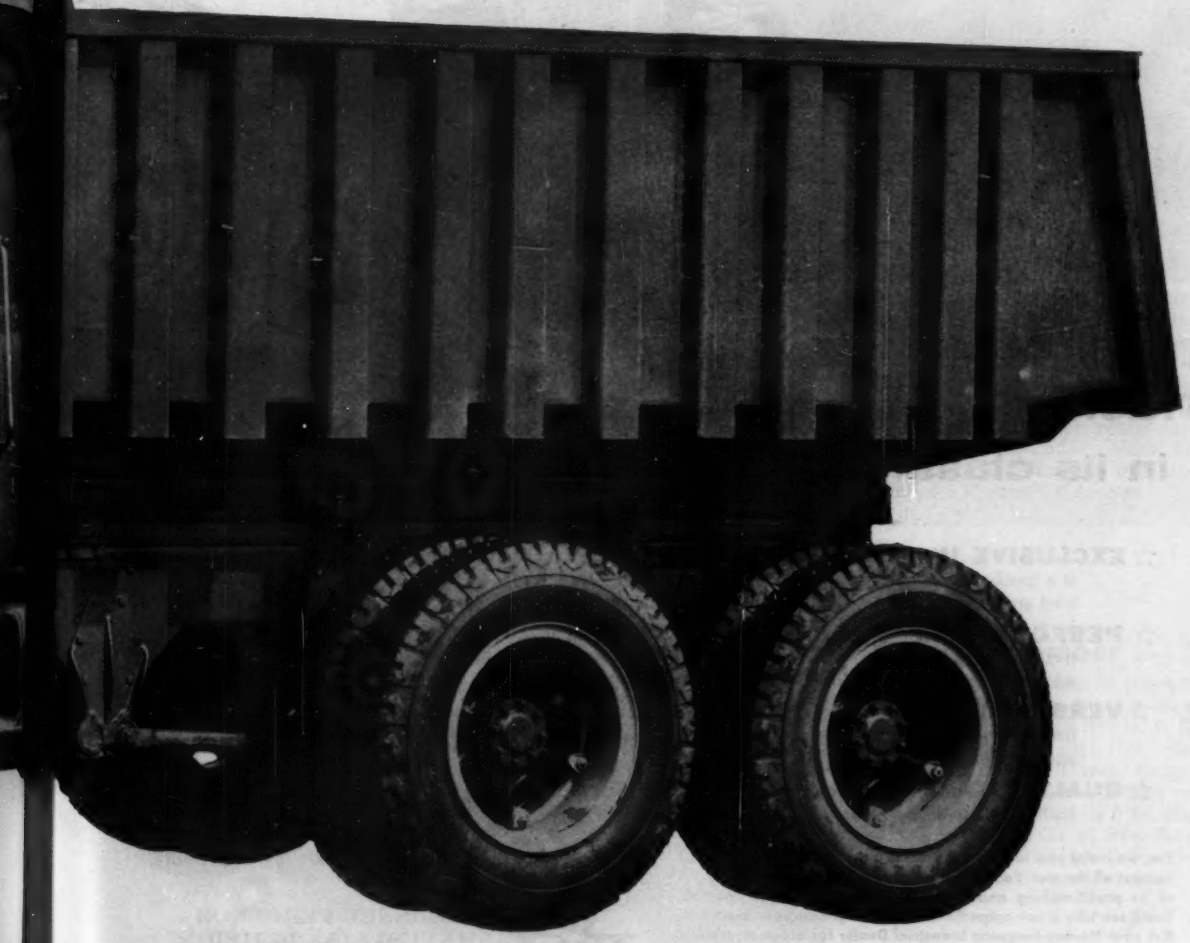
INTERNATIONAL Dump Trucks ready for immediate delivery!

Call your INTERNATIONAL Dealer now. Trucks with bodies, hoists, frame reinforcements, etc. will be shipped from INTERNATIONAL Truck Sales Processing Center 24 hrs. after they receive order!

Model Series	RF-192	BCF-182	B-184	B-182	B-164
Gross Vehicle Rating	43,000	33,000	24,000	21,000	19,000
Body	8-10 Yd.	8 Yd.	4 Yd.	4 Yd.	4 Yd.
Wheelbase	157 in.	149 in.	141 in.	141 in.	129 in.
Engine	450 cu. in.	308 cu. in.	308 cu. in.	308 cu. in.	264 cu. in.
Transmission	5-speed Direct, 3-speed Auxiliary	5-speed Direct, 3-speed Auxiliary	5-speed Direct	5-speed Direct	4-speed Synchro-mesh
Rear Axle and Capacity	34,000 single-reduction tandem	28,000 single-reduction tandem	18,500 2-speed	16,000 2-speed	15,000 2-speed
Tires	9.00 x 20 10 ply	9.00 x 20 10 ply	10.00 x 20 12 ply	9.00 x 20 10 ply	8.25 x 20 10 ply
Frame Reinforcements	Inverted "L"	Inverted "L"	Inverted "L"	Inverted "L"	Inverted "L"
Springs	Std.	Std.	Yes	Yes	Yes

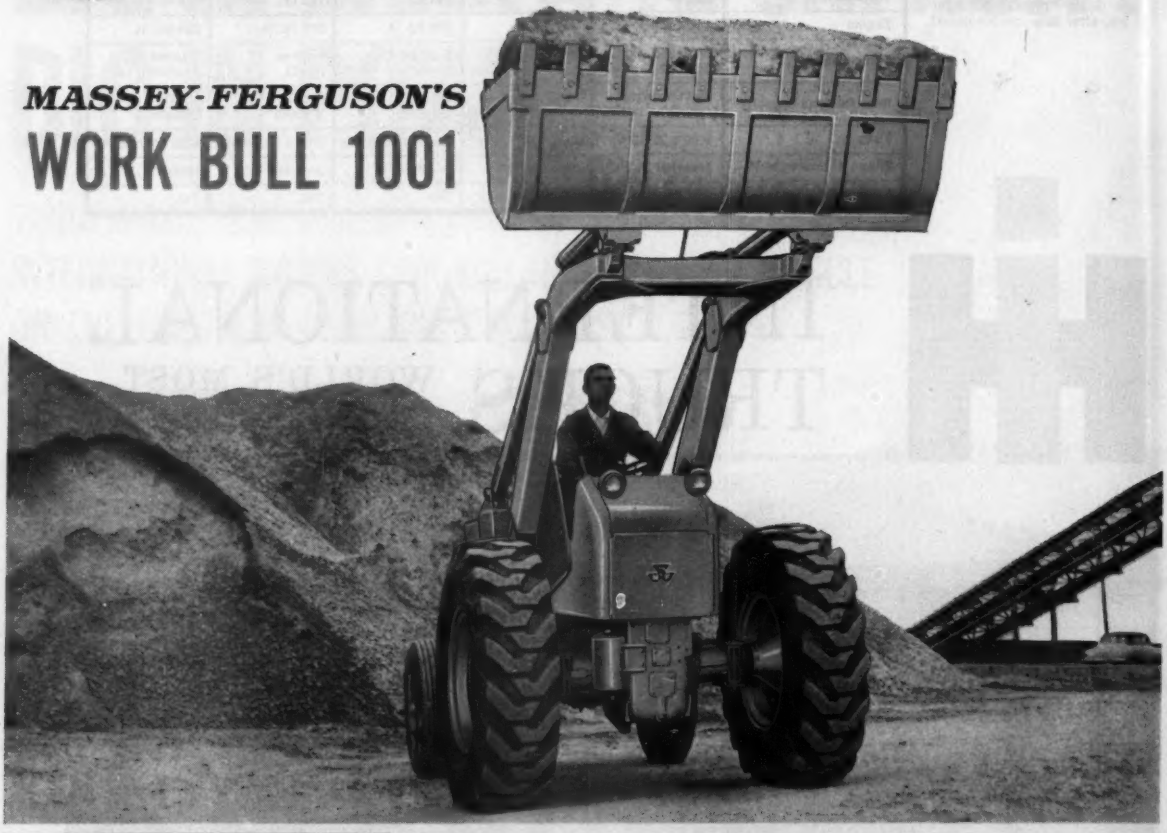
INTERNATIONAL® TRUCKS WORLD'S MOST COMPLETE LINE

International Harvester Co., Chicago • Motor Trucks • Crawler Tractors • Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



COMPARE-

MASSEY-FERGUSON'S
WORK BULL 1001



against any Tractor Shovel in its class!

☆ **EXCLUSIVE INSTANT REVERSING**—Change direction of travel — either forward or reverse—at a touch of your toe — no shifting . . . no clutching . . . no levers to pull. Shortens cycle time between load and dump.

☆ **PERFORMANCE**—One cubic yard SAE rated capacity, 43° rollback at ground level, direct-line thrust, torque converter, power steering, maximum visibility, five equal speeds forward and reverse add up to greater on-the-job performance.

☆ **VERSATILITY**—A full range of perfectly matched attachments include a combination Davis Backhoe-backfill blade, asphalt spreader, pick-up street sweeper, rotary boom, angle dozer, crane, fork lift, scarifier, and a variety of buckets.

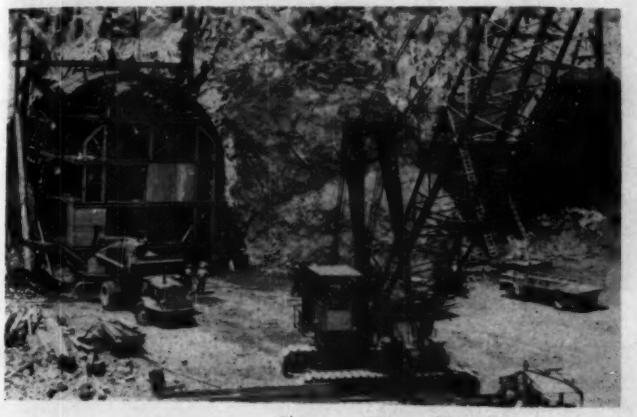
☆ **QUALITY**—Designed and manufactured for rugged construction and industrial applications. Has strength built-in and quality in every part.

Yes, we invite you to compare Massey-Ferguson's Work Bull 1001 against all the rest. You'll soon be convinced of its superiority . . . of its profit-making and time-saving advantages on the job. You'll see why it can outperform costly, single-purpose machines. Ask your Massey-Ferguson Industrial Dealer for a demonstration.

Why Wait? Set a Date — We'll Demonstrate!

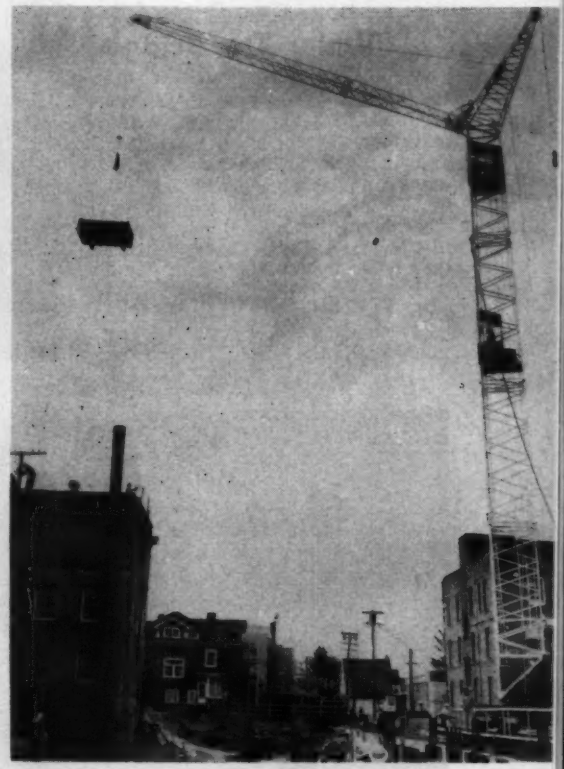
MASSEY-FERGUSON INDUSTRIAL DIVISION
Block 1000 South West Street • Wichita 13N, Kansas

Construction News in Pictures . . .



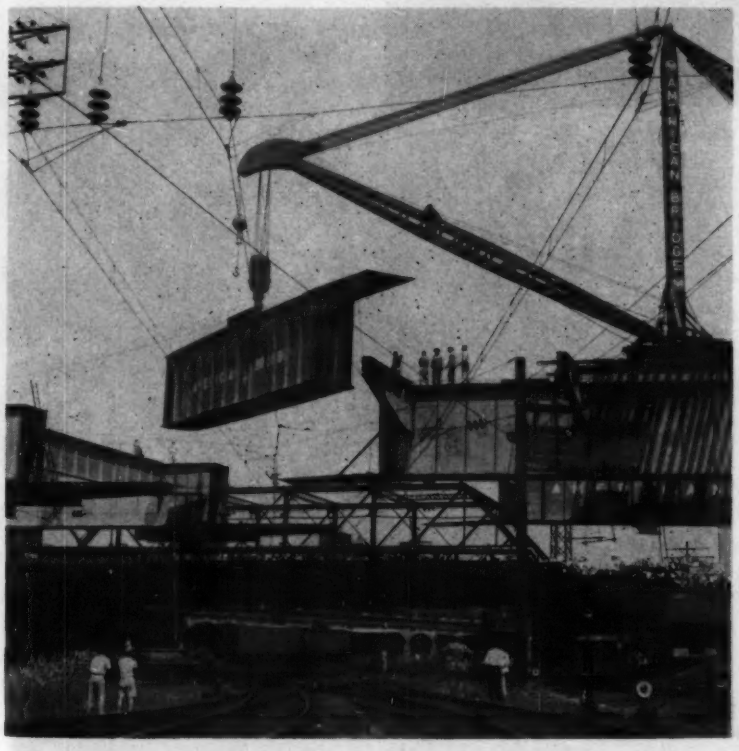
Tunneling Tool

A four-level jumbo mounting a total of 19 Ingersoll-Rand air drills on hydraulic booms is working at Oxbow Dam on the Snake River. Morrison-Knudsen Co. designed and built the rig to drill two tunnels 42 ft in diameter and 1,000 ft long that will carry water from the upstream reservoir to the penstocks that serve the powerhouse.



Long Reach

Traveling tower crane built in Germany is at work on the $3-million Group Health Hospital in Seattle. The Beatty-Pecco crane can lift a 3½-ton load 14 stories; with shortened jib it can lift a 7-ton load five stories. Or it can reach out 70 ft on either side of the mast. Joint venture contractor on the job is Johnson-Morrison-Knudsen.



Closing Member

Stiffleg derrick sets in place one of the final girders for the longest box-girder bridge in the U. S. The bridge is part of the Oak Street Connector in New Haven, Conn. It consists of a 378 ft 9 in. center span and side spans of 151 ft 6 in. Mariani Construction Co. of New Haven is general contractor. American Bridge Div. is the steel erector.

Under The Bridge

Horvitz Co. of Cleveland dismantle the gantry on their Manitowoc 3600 dragline, lower the boom, move the rig under a bridge, and erect it again in less than 30 minutes. They have performed this operation 15 times in excavating for a section of the Inner Belt Freeway in Cleveland. Under their contract they will move 600,000 yd. of earth.

Ahead of Schedule

After three years of construction, Priest Rapids Dam on the Columbia River in Washington is 80% completed and a full 16 months ahead of schedule. Work continues on the 1,025-ft-long powerhouse and some of the 22 spillway sections. Merritt-Chapman & Scott Corp. of New York is the general contractor for the $98-million job.

Steady Progress

International TD-14 sideboom positions a 50-ft section of 6-in. pipe near Lumberton, N. C. H. L. Gentry Construction Co. is completing 222 miles of pipeline for the North Carolina Natural Gas Corp. Gentry's crew is laying as much as 7,500 ft of pipe daily despite frequent heavy rains. Included are two major river crossings.

ENGINEER'S FIELD REPORT

PRODUCT RPM MULTI-SERVICE GEAR LUBRICANT

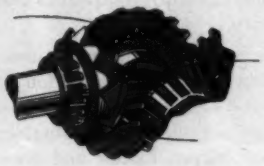
FIRM YAKIMA CEMENT PRODUCTS CO. Yakima, Washington

No scoring or pitting of differential gears in 6 years

In Six Years of using RPM Multi-Service Gear Lubricant, not one differential in the entire 20-truck fleet of Yakima Cement Products Co. has shown any scoring or pitting of gear teeth. Despite grueling service delivering ready-mix concrete and other building materials to off-highway construction sites, lubricant has never failed to do its job. Firm's six-wheel-drive trucks supply sand, gravel, ready-mix concrete, and fabricated concrete products to projects within 100 miles of Yakima, Washington.

Ready-Mix Truck like rest of firm's vehicles, is rebuilt Army surplus 2½-3 ton International. "In the fleet of 21 six-wheel-drive trucks, we have never had a transmission or differential failure due to lubrication, despite our severe operating conditions since we started using RPM Multi-Service Gear Lubricant," says firm's chief mechanic, Art Weber. This lubricant is also used in all mixer drive gear boxes.

Why RPM Multi-Service Gear Lubricant prevents wear



- Special compound forms protective lubricating coating on gears by chemical reaction with metal...resists rubbing action of hypoid gear teeth.
- Withstands extreme temperatures and pressures...highly oxidation resistant...keeps bearings and gears cool.
- Inhibitors resist rusting, stop foaming...lubricates integral bearings...will not separate.

For More Information or field help with any fuel or lubrication problem, contact representative of any company listed or write direct.

AUTOMOTIVE LUBRICANTS RPM

TRADEMARK "RPM DELO" AND DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

Crane boom built 30% lighter

with USS "T-1" Steel Tubing

The Dreier Structural Steel Co., Inc., Long Island City, New York, needed a new boom for its 100-foot truck crane. They wanted to build it light yet keep the same strength.

When Morris Dreier investigated the possibilities of USS "T-1" Constructional Alloy Steel, he got together with Phil Krohn, Chief Engineer of Boom and Crane Corporation. Krohn came up with the design for a new boom welded from USS "T-1" Steel tubing.

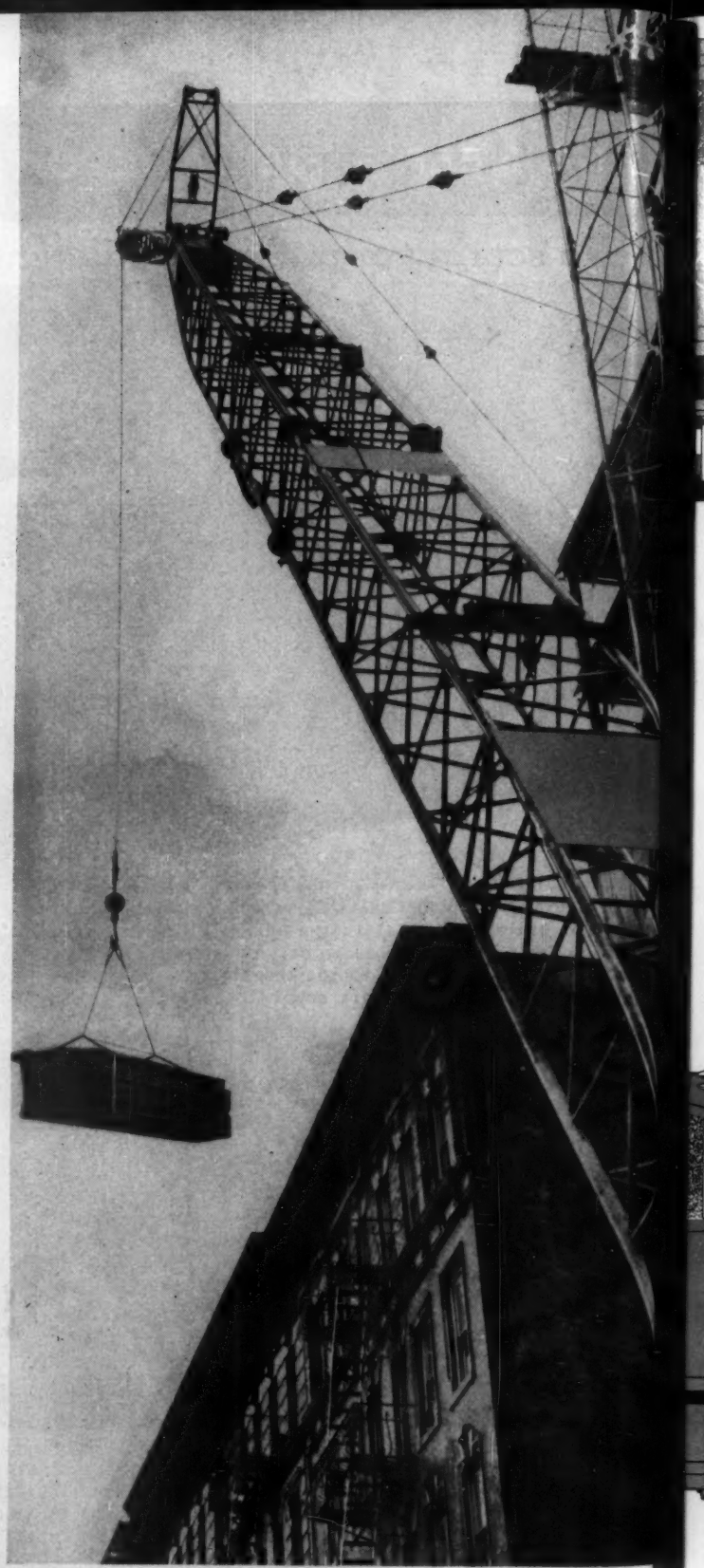
Says Krohn: "By using 'T-1' Steel Seamless Tubing from USS's National Tube Division we found we could reduce the weight of the boom by one-third due to the reduced wall thickness required. Thanks to the boom's lighter weight and high strength, the crane is now able to reach farther and pick up more than ever."

As for maintenance, Dreier and Krohn agreed that there would be less because "T-1" Steel has four times the atmospheric corrosion resistance of structural carbon steels. The crane has been in use for a year, now, and it looks brand new. Since this time, booms up to 250 feet long have been made and successfully used by contractors throughout the country.

This is just one of the many uses of USS "T-1" Steel in the construction industry. "T-1" Steel's minimum yield strength of 100,000 psi permits earth-moving equipment to be built bigger, lighter and brawnier. It hauls more payload—lasts much longer.

And USS "T-1" Steel's high resistance to impact abrasion boosts the life of shovel buckets, chutes and bins. Why not find out how "T-1" and USS High-Strength Steels can reduce your costs. Contact our nearest Sales Office or write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS and "T-1" are registered trademarks



Lighter weight crane can handle more jobs, reach farther and faster, because of extra strong boom of USS "T-1" Steel tubing.

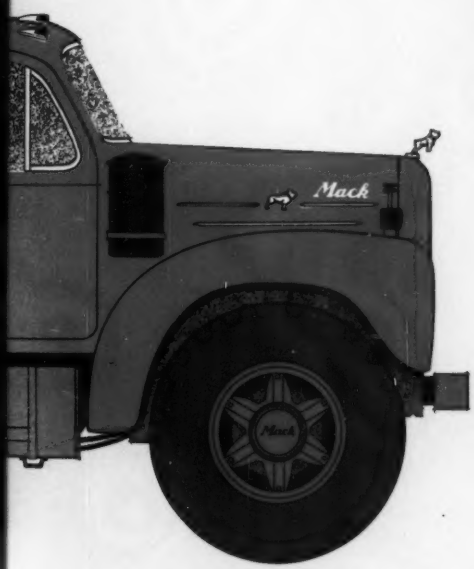
New color movie available—"Challenge at Carquinez." A 27-minute, 16mm. color film showing the design and construction of the unique Carquinez Strait Bridge. Ideal for engineering groups. For booking information, write United States Steel, Pittsburgh Film Distribution Center, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
National Tube Division – Pittsburgh
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

United States Steel

MACK BALANCED DESIGN



gives you more for each truck dollar

Mack Balanced Design is achieved by engineering and building components which work together with maximum efficiency. Only Mack can offer Balanced Design because only Mack makes all its own major components... makes them to standards of ruggedness and precision accomplished nowhere else. Mack Balanced Design results in a truck whose engine, clutch, transmission, axles and suspensions all work in harmony to produce an uncommonly smooth, powerful, responsive unit.

There's a MACK fo

Mack B-40 Series—5 to 10 yards as rear dumpers, 5½ to 7 as mixers

They combine big-truck power, capacity and stamina with small-truck agility and economy for service as dumpers, tractors, mixers and platform trucks. 150 hp Mack Magnadyne gasoline engine. Wide choice of Mack transmissions up to 20-speed units, in on-highway and off-highway versions (depending on model). Choice of heavy-duty axles and frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers offer Mack Balanced Bogie with Power Divider. All-wheel-drive units as well.

very construction job

Mack B-30 Series—6 to 12 yards as rear dumpers, 5½ to 8 as mixers

These trucks have hung up records for economy and long mileage life on every kind of job—as dumpers, mixers, tractors and platform trucks. The "workhorse of the industry", they're powered with Mack Thermodyne® gasoline or diesel engines from 170 to 205 hp. Wide choice of Mack transmissions up to 20-speed units, in both on-highway and off-highway versions (depending on model). Choice of heavy-duty axles as well as frames that offer standard and optional reinforcement. Option of power steering. Six-wheelers feature exclusive Mack Balanced Bogie with Power Divider.

There's a MACK fo

Mack B-80 Series—7 to 14 yards as rear dumpers, 7½ to 10 as mixers

Here's Mack profit-power personified! Big, rugged B-80's can be custom-assembled to meet your needs exactly: as tractors for heavy-duty hauling of platform or dump trailers... or as truck chassis for dumper, mixer or utility service. Wide option of power and gear ratios. Available in 4- and 6-wheel models inciuding six-wheel-drive units. Powerful, durable braking power.

Up to 232 hp Mack gasoline or 205 hp Mack Thermodyne diesel engines; up to 320 hp stock diesels. Choice of Mack transmissions including Mack 20-speed Quadruplex. Mack Dual Reduction rear axles and—on 6 wheelers—Mack Balanced Bogie with Power Divider. Mack front-wheel drive axle on six-wheel-drive models. Option of power steering.

Mack "L" Series—15-25 ton end-dumpers to 50-ton bottom dumper

The Macks in the "L" Series—LRX 15-ton, LR18X 18-ton, LVX 22½-ton, LV25X 25-ton and the giant LRVX tractor which pulls 50-ton bottom dumper—are designed with the power and strength to handle the biggest construction jobs. They shrug off the relentless pounding of big-yardage shovels, and are loaded with features for top performance, long life and freedom from downtime.

Rugged power trains offer up to 450 hp diesel engines... Mack overgeared transmissions or torque converters and Mack Planidrive rear axles... powerful air brakes of latest design handle steepest descents... maneuverability characteristics of smaller vehicles – thanks to ideal power steering and air-assisted clutch.

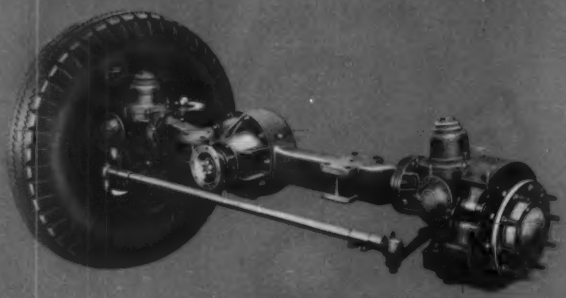
For end-dumper capacities up to 40 tons, where maximum flotation is required, a full line of tandem rear axle Macks is available.

MACK BALANCED DESIGN

MACK
for over 6 straight years
NO. 1
by far in sales of diesel trucks

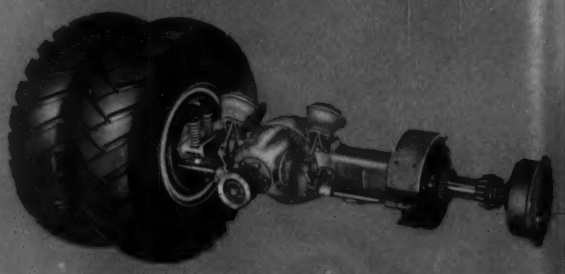
means components integrated for longest prime of life.

Only Mack offers these exclusive quality components:



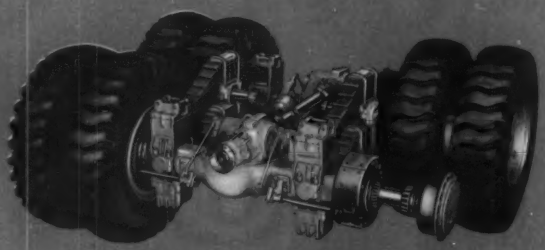
Strong Mack-built axles

Mack's drop-forged I-beam front axles are made super strong for long, trouble-free service. Extensive use of heat-treated steels for crucial parts means minimum maintenance. And Mack's exclusive **front-drive axle** (shown above) for all-wheel-drive trucks offers the greatest ground clearance and strength of any made—with all parts fully enclosed.



Durable Mack-built 2-wheel rear axles

Mack's two-wheel, rear-axle assemblies have an unmatched reputation for service under strenuous conditions. Dual Reduction carrier and Mack's famous Planidrive gear reduction at the wheel hubs provide the smooth distribution of power vital to top truck performance.



High-traction Mack-built Balanced Bogies

Macks perform where other trucks bog down—in mud, loose gravel or sand—thanks to Mack's exclusive Balanced Bogie with Power Divider—a 4-wheel drive, tandem rear-axle assembly with an inter-axle differential that distributes the power to wheels with greater traction. To achieve maximum road clearance in larger units, Mack Planidrive final reduction gears in all 4 hubs eliminate the need for outsized carriers and low-slung differentials.

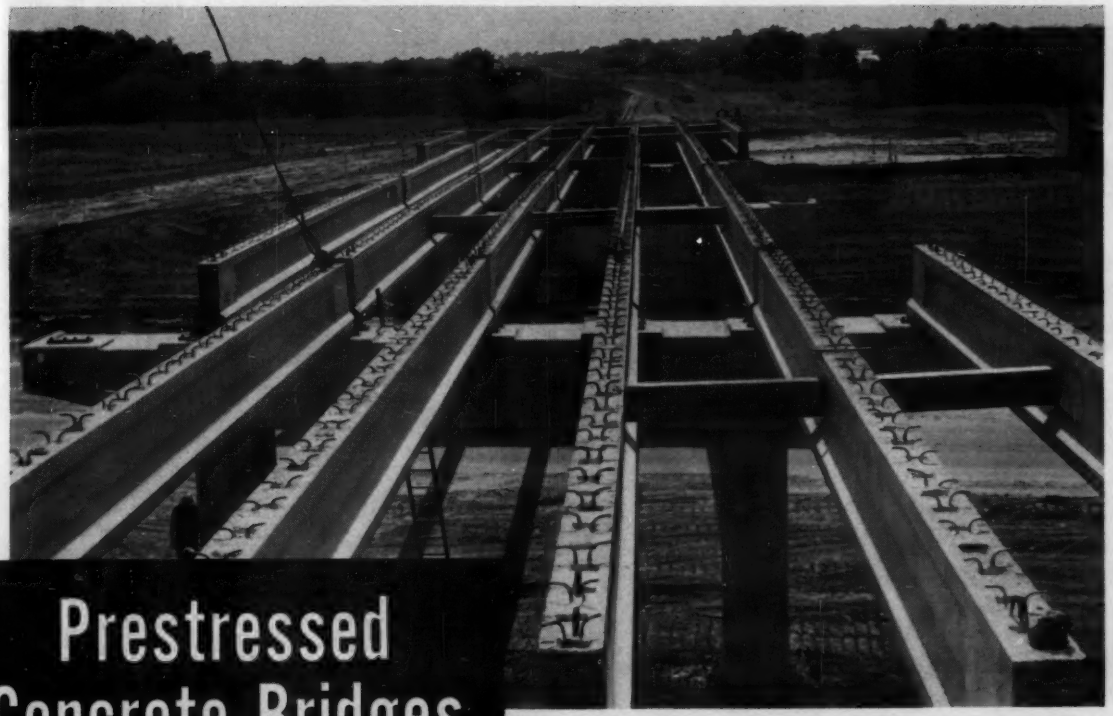
Long-lived Mack-built transmissions

Service records prove that Mack transmissions—like this 20-speed Quadruplex—stand up to heavy-duty hauling far longer and need less attention than any others—thanks to the use of the finest gear metals known... to painstaking precision manufacture... and to exclusive Tetrapoid gear design that gives maximum strength, longer life and smoother action. Five- to twenty-speed units, each with ideal ratio steps.

MACK FIRST NAME FOR TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd., Toronto, Ontario

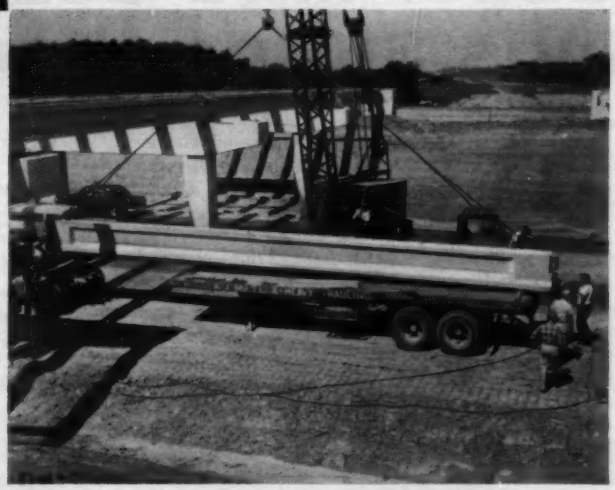
Printed in U.S.A.



Prestressed Concrete Bridges
ON INTERSTATE ROUTE 40

Twin structures for U.S. Route 45 cloverleaf on Interstate Route 40, just north of Jackson, Tennessee.

A 51′ beam ready to be moved from truck to piers. Traffic under bridge continues without interruption.



As the construction tempo of the new Interstate Highway System increases, more and more of its structures are being designed for prestressed concrete beams. Low first cost, negligible maintenance, speed of erection, and attractive appearance are the reasons for this growing preference for prestressed concrete.

An example is the new Interstate Route 40 by-pass of Jackson, Tenn. Eight of the nine bridges on this job will have prestressed beams. A total of 264 beams will be used, ranging in length from 35′9″ to 92′3″, with the largest members weighing 47 tons each.

In the manufacture of these beams, R. H. Wright, Inc. used Lehigh Early Strength Cement for maximum production efficiency. Units were completed quickly, ready for trucking to the job site as needed.

This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction.

Owner: Tennessee Highway Dept.

Contractor: Oman Construction Co. Nashville, Tennessee

Consulting Engineers: Lockwood, Kessler & Bartlett, Inc., Syosset, N. Y.

Prestressed beams manufactured at Milan, Tenn. plant of R. H. Wright, Inc., Fort Lauderdale, Fla.

Ready mix concrete for beams: Harpole Concrete Co., Milan, Tenn.

Lehigh Portland Cement Co.
ALLENTOWN, PA.

Rubber-tired dozer plugs $10 per hour profit leak

The problem was sand. 3,400,000 yds of blow sand, playing its usual havoc with crawler tracks. Particularly with push-dozer tracks. J. C. O'Connor & Sons, Inc, Fort Wayne, rebuilding a federal highway in Indiana, found their 320 hp pusher, working this rough material, needed a track repair job *every 700 hours*. Cost, $7,000! Or $10 an hour—over and above normal operating costs.

When need arose for a second pusher, O'Connor got ready to shell out another $10 an hour.

"Before we do," said the project supt and a 29-year veteran in the business, "let's look at the latest rubber-tired dozers. Sand shouldn't be nearly as hard on rubber as it is on steel tracks."

"Agreed," management answered. "But any rubber-shod rig we buy *must* do as good a pushing job as our 320 hp crawler!"

One machine did. A 375 hp Michigan Model 380 Dozer brought in by the Clark distributor. O'Connor bought it!

15 pay yds: 20 to 80 seconds

From that day on, the Michigan and the big crawler

High dozing speeds let the one Michigan do work of two crawlers, spreading fill.

Fast backup, power-shifted at flick of small lever, saves deadhead time between push cycles.

Maintenance costs went way down when Michigan Dozer went to work on this highway relocation.

Veteran operator analyzes the new Michigan Dozer

(The writer used to be J. C. O'Connor's boss scraper operator—the man who paced the fleet, helped decide which section of the borrow should be cut, etc. He tested the Michigan, now operates it. Here's what he says . . .)

"What's the difference between a crawler and a Michigan pusher? Well, first of all, you get an entirely different view of things from the Michigan. You sit higher. You look down on the scraper operator. You can see his signal or signal him without looking up, over or around a pile of dirt. You can see the load coming into the bowl and your blade contacting the scraper pushblock.

"Sticking with the pushblock is easier, too. If the scraper starts to drift to one side, all you do is turn your steering wheel slightly. No need to lock a track or skid and slide around. Or if the scraper starts to bog down, the Michigan's torque converter automatically gives you less speed (and more power) without foot-clutching or shifting gears. If the scraper starts to run away, you automatically get more speed (and less power). So you and the scraper work together from one end of the cut to the other.

"With the Michigan, you normally can push faster than with a crawler, thus get better load boiling and tighter fuller packing. I normally push at speeds up to 6½ mph (second gear). Sometimes, in tough going, I power shift down to low by moving a lever the way you do on an automatic transmission car. (No clutching.) Then, I work at about 3 mph. On easy pushing, I move up to third gear (13 mph). I back up at 13 mph too.

"Here's another trick I've learned. After pushing a pan through the cut—especially if the swath is rough and bumpy—I down-pressure the blade to ground level, and power-shift into reverse. The blade chops off all high points, makes the ground smooth again. It means better travel for the next pan you push through! And more production!"

together handled push-loading of a fleet of seven 25-yd scrapers. Performance of the two pushers was very much the same. Per-scraper load time, either loading unit, varied from 20 to 80 seconds (depending upon the soil). Scraper loads, with either crawler or Michigan, measured 15-plus pay yds. Output, per pusher, with scrapers on one mile haul, ran about 2,150 pay yds per 8-hour day.

Speed provides bonus

Why was J. C. O'Connor so pleased? Well, he eliminated $10 an hour in track maintenance, at no decrease in push-loading efficiency. He also got a bonus in speed. One day, for instance, the Michigan alone spread all fill . . . a job which normally took two 191 hp crawler dozers. Another time, when the pushers had to work two different borrow areas in one day, the 25 mph Michigan reached the second site so quickly it got in half an hour's work while the crawler was still creeping along the road shoulder. And the firm expects to use the Michigan on still other applications on other jobs. Says the supt, "This unit sure is *not* just a special-purpose sand machine. It can do as good a job as a crawler—or a better one—on about 70% of what some people call "big crawler" applications. Mud, not as good maybe. But sand, clay, dirt—excellent!"

See for yourself. Write our sales department, in Benton Harbor for data. Or call your nearest Michigan Distributor for a demonstration.

CLARK EQUIPMENT

Michigan is a registered trademark of
Clark Equipment Company
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 14, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

Powerful 335 hp Michigan cuts into bank of frozen rocky material.

Standard shovel-truck fleet job handled by one Michigan

Load-haul-dump output averages 200 pay yds hourly on 500 ft cycle

Study this side-hill cut near Anaconda, Montana, and you'd say it was a job for swing shovel and trucks. Tough rocky material (here and throughout the $432,000, 400,000 yd, 2¼ mile mountain-area road-widening contract). Haul in open traffic. Dump over a 30 ft bank into a lake. But the contractor—Kiely Construction Company of Butte—decided on something else. Perhaps their big 6 yd 335 hp Michigan Tractor Shovel could do the work alone, they reasoned. One machine versus three or four? Worth trying!

25 mph haul speeds

First step, then, was for the Michigan to work its bucket edge under a rock outcropping. Quick as you read these words, out came a bucketful. Load time was under 10 seconds. This load (and others) measured out at 4½ to 5 *pay yards*. Each load—*instead of being heaped into a truck*—was then Michigan-hauled 250 to 300 ft down the right-of-way and dumped over the bank. Then back to the cut (at 25 mph) and another load.

Hour after hour went the operation. At the end of a 10 hour day, the borrow was cross-sectioned. *The Michigan had moved 2,000 pay yards!* "Production was about what we would expect with a 2½ yd swing shovel and two or three haulers," according to J. H. Schields, company V.P. "Traffic congestion cost us about 10 to 15% of our probable

Bucket heaped, the Michigan hauls load to waste area 300 ft away.

Output with this one 6 yd machine is near what big swing shovel and two or three trucks could do.

output," he adds, "but we were sure pleased with the results and the cost saving . . . one machine versus three or four." *It was a job no other Tractor Shovel could have done economically* . . . only the Michigan 375A, its 6 yard bucket, and 30,000 lb lift capacity.

Ability to handle boulders saves secondary blasting

Kiely Construction Company bought this rig originally on the basis of their good experience with smaller Michigan Tractor Shovels . . . plus the belief its exceptional power could provide high production *on a variety of jobs* . . . plus the expectation of continued good service from their Michigan distributor, Miller Machinery Co. The big Michigan has been frequently used, for example, to lift and carry oversize boulders away from rock cuts. Its 6 yard bucket works here "much better," according to men on the job, than power shovel's 2½ yards. This use of Michigan also saves secondary blasting.

Push-loads scrapers

The Michigan has also been used for push-loading 27 yd scrapers . . . a job made possible by the Model 375A's 335 hp, its rear-mounted push-plate, torque converter power-shift drive, good all-around visibility, and same speeds backing up as forward.

Other assignments include truck-loading shot rock. Digging culverts. Cleaning spillage from haul roads. Backfilling drain pipe.

Demonstration now available

We'd welcome the opportunity to show *you* how the Michigan Model 375A's power, capacity and mobility can combine to boost *your* production and efficiency. Call us for a demonstration—*soon*—before you bid your next job.

(P.S. Smaller Michigans still available too, of course. Seven models, 16 cubic feet to 4 cubic yds standard SAE buckets . . . 3,000 lbs to 22,000 lbs lift capacities.)

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2403 Pipestone Road
Benton Harbor 36
Michigan

CLARK® EQUIPMENT

In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

"Comparative studies sold us," reports N. Y. contractor

His 3 Michigan Tractor Scrapers live up to expectations, prove particularly fast on hilly hauls.

When Watertown Construction Co, Watertown, N. Y., decided to buy scrapers for their earth-moving operations, owners Ralph and Richard Buckley had some pretty basic requirements in mind.

They wanted units that would be easy to load, yet would pack in a high percent of *pay* yardage. They wanted speed on the haul, particularly where grade changes were frequent. And they wanted a high degree of availability to keep production flowing and to keep repair time and costs down.

Michigans win comparison test

To check their needs first-hand, they went to the people who knew best—other scraper users. They watched jobs. They made time studies. And they came away most impressed with one make—*Michigan!*

That was last spring. Today, Watertown Construction Co owns three 19 yd Model 210 Michigan Tractor Scrapers. "We *could* have bought 10½ yd or 29 yd Michigans," says Dick Buckley. "But the 19 yd size best fit our needs. We liked its price, also the financing arrangements and the service offered by our Michigan distributor (J. C. Georg of Syracuse)."

Fleet output: 5,040 yds daily

Typical of Michigan performance is the job pictured—a 5 mile, 200,000 yard subcontract (from Warren Bros) of new county highway north of Syracuse.

Loading in wet sandy material, with help of Watertown's veteran 225 hp torque

Loads average 14 to 15 pay yards each. Ability of the 262 hp Michigan Tractor Scrapers to partially self-load cuts pusher-load time.

Within seconds after leaving borrow pit, power shift-torque converter Michigans are hauling at top speed—over 30 mph.

Spread is made evenly in lifts as small as 1 to 2 inches. Scraper *cuts* smoothly and accurately too, thus minimizes dozer ditching and trim time.

converter tractor, takes average of 30 seconds. Loads average, per cross-section computations, about 14 pay yards each.

Haul is made almost entirely in top gear—*over 30 mph.* Where grade changes are encountered, operators change gears instantly at the flick of a lever—no clutching. Two important parts of the all-Clark power train, the power-shift transmission and the torque converter, do the work. Typical 5,400 ft cycles average just over 3 minutes. Fleet output averages 36 loads per 50-minute hour, 360 loads per 10-hour day.

Availability has been better than 98%, according to Larry Balcom, master mechanic. "Since we started the job last spring," he says, "our total downtime for all three pans has been less than one day!"

More quotes . . .

Ralph Buckley, co-owner: "These are the fastest scrapers I've *ever seen* . . . high speed gives us *several extra loads per hour.*"

Dick Buckley, co-owner: "Our Michigan Tractor Scrapers get good loads no matter what the material. They move fast even through wet, spongy footing. Fuel consumption is low too."

Carl Runge, supt: "It's your speed that counts and if you've got the power—and the power train—you can get the speed. *These* pans have more usable horsepower per yard of capacity than any machine I've ever seen."

W. E. Singleton, operator: "Less bounce and less motor noise make the Michigans easy to operate fast all day long."

We at Clark: "See for yourself. Let your Michigan Distributor show you a Michigan Tractor Scraper *in action.* Call to arrange a date. No obligation."

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

2403 Pipestone Road
Benton Harbor 37, Michigan
In Canada:
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St. Thomas, Ontario

Construction 'Round the World . . .

In Switzerland

Sand and gravel that will go into powerhouse concrete is stockpiled at the downstream channel area of the 777-ft-high Mauvoisin Dam. L'-Association des Entrepreneurs du Barrage de Mauvoisin, a combine of five Swiss contractors, is building the hydroelectric power dam.

In England

A Parker Rockranger portable crushing plant spews out 4-in. limestone aggregate at a rate of 2,000 tons a week for the base course of a 3-mi road improvement job at Stormy Down near Bridgend, South Wales. The plant is one of the first of it's kind made by Frederick Parker, Ltd. It works for contractor T. S. Rees of South Cornelly.

In Australia

Water tumbles over intermediate blocks of Warragamba Dam nearing completion at Sidney. A combination flood control and water supply project, the dam will have a crest 1,100 ft long and a height of 400 ft. A three-part spillway 300 ft long will be divided by two piers.

For big power requirements

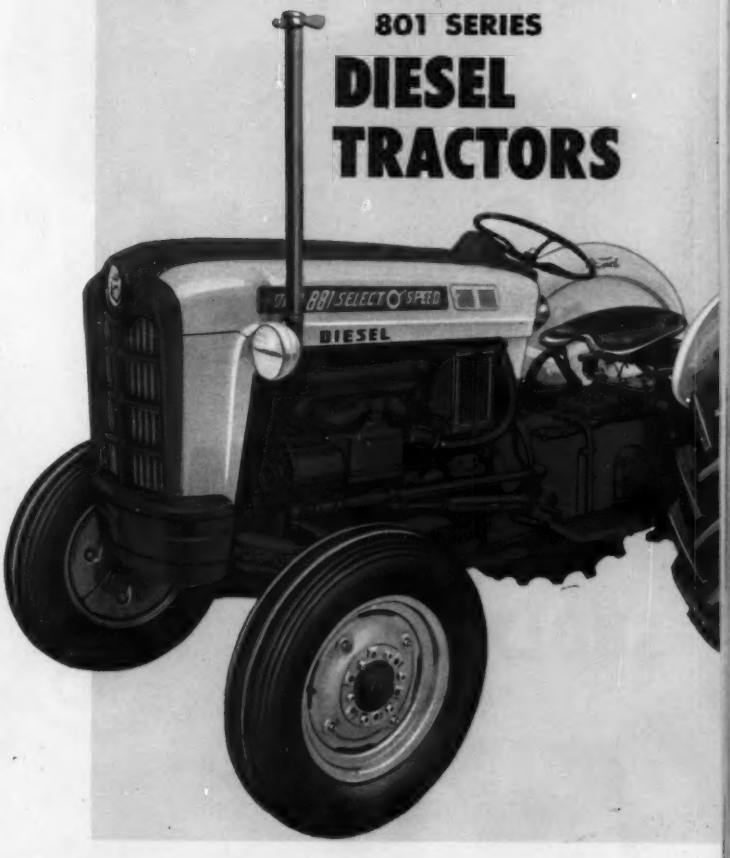
Extra lugging ability, fuel economy. Quick starts even in zero weather!

Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating) ..... 56 H.P.
Engine displacement ..... 172 cu. in.
Compression ratio ..... 16.8 to 1
Number of models 7
Transmission options ..... 4 or 10-speed "Select-O-Speed"
Heavy duty front end with industrial clutch ..... Optional
Available without hydraulic system and power take-off ..... Yes
Front tires ..... 6.00 x 16
Rear tires ..... 10 x 28, 11 x 28 and 12 x 28
Wheelbase at 52" front tread ..... 74.50"
Turning radius, brake locked (w/52" min. tread) ..... 8'11"
Overall height w/12" rear tires ..... 57.29"
Overall length at 52" front tread ..... 120.83"
Overall width at 52" tread ..... 63.88"
Overall width at 76" tread ..... 87.50"
Min. ground clearance (under transmission case) ..... 13.98"
Factory installed options include: Power steering, power adjusted wheels, auxiliary over-under transmission which provides 12 speeds forward when used with 4-speed transmission, and new "shift-on-the-go" Select-O-Speed.
Typical working weight with front and rear tire fill, front and rear wheel weights ..... 5617 lbs.

FORD

801 SERIES

DIESEL TRACTORS



all new...
all diesels...
all from
FORD...

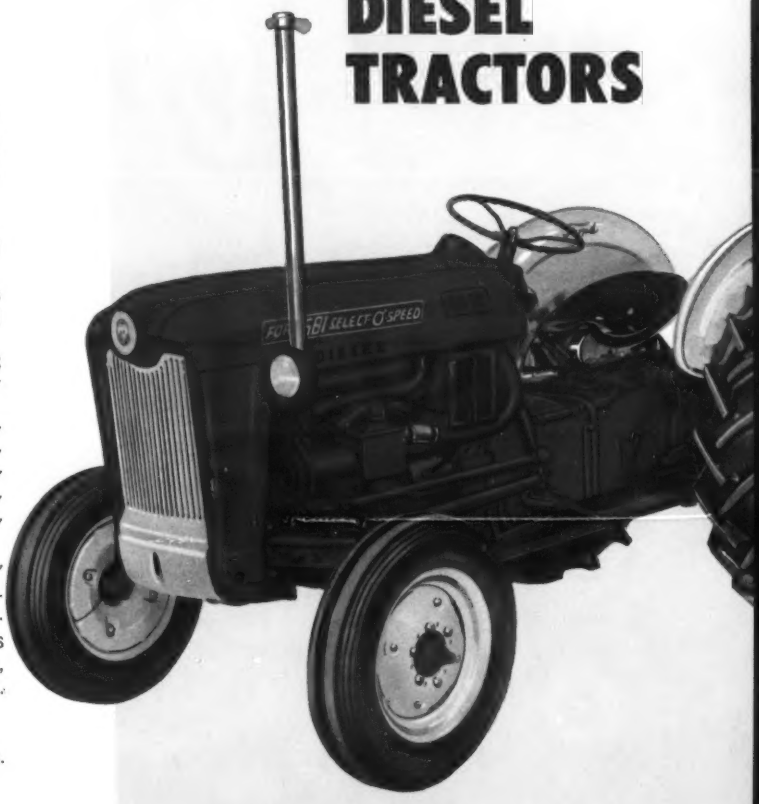
For rock bottom original cost

***Lowest* cost diesel tractors in their power class!**

Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating).....41 H.P.
Engine displacement.....144 cu. in.
Number of models.....8
Transmission options.....4 or 10-speed "Select-O-Speed"
Heavy duty front end with industrial clutch.....Optional
Available without hydraulic system and power take-off.....Yes
Front tires.....5.50 x 16 (6-ply 6.50 x 16 and 7.50 x 16 for HD front end)
Rear tires.....10 x 28 and 11 x 28
Wheelbase at 52" front tread.....74.50"
Turning radius, brake locked (w/52" min. tread).....8'11"
Overall height w/11" rear tires.....56.15"
Overall length at 52" front tread.....120.83"
Overall width at 52" tread.....63.88"
Overall width at 76" tread.....87.50"
Min. ground clearance (under transmission case).....13.22"
Factory installed options include: Power steering, power adjusted wheels, auxiliary over-under transmission which provides 12 speeds forward when used with 4-speed transmission, and new "shift-on-the-go" Select-O-Speed.
Typical working weight with front and rear tire fill, front and rear wheel weights.....4716 lbs.

FORD

601 SERIES DIESEL TRACTORS



For economy, dependability on the big jobs

Gallon-an-hour fuel scrimper. Operates for pennies an hour, dimes a day!

Max. corrected brake H.P. (less accessories @ 1700 rpm; manufacturer's rating).....54 H.P.
Engine displacement.....220 cu. in.

FORDSON

POWER MAJOR DIESELS

Max. corrected brake H.P. (less accessories @ 1700 rpm; manufacturer's rating) ..... 54 H.P.
Engine displacement ..... 220 cu. in.
Number of models 4
Transmission ..... 6 speeds forward, 2 reverse
Available without hydraulic system ..... Yes
Front tires ..... 7.50 x 16
Rear tires ..... 12 x 38 and 14 x 30
Wheelbase ..... 80″
Turning radius, brake locked (w/58″ min. tread) ..... 12′1″
Height to top of steering wheel ..... 63″
Overall length ..... 130.5″
Overall width, maximum ..... 85″
minimum ..... 65″
Min. ground clearance (drawbar) ..... 12.75″
Factory installed options include: Power steering, raised or "live" power take-off, automatic clutch release, belt pulley and horizontal muffler.
Typical working weight with front and rear tire fill, front and rear wheel weights ..... 7361 lbs.

And for peak productivity on industrial jobs

Direct injection fuel system with automatic timing for peak power, peak savings on fuel!

Max. corrected brake H.P. (less accessories @ 2200 rpm; manufacturer's rating) ..... 56 H.P.
Engine displacement ..... 172 cu. in.
Number of models 5
Transmission options ..... 4-speed, reversing, "Select-O-Speed"
Available without hydraulic system and power take-off ..... Yes
Front tires ..... 7.50 x 16—8 ply
Rear tires ..... 12 x 28, 13 x 24, 13 x 28 and 14 x 24
Wheelbase ..... 81.5″
Turning radius, brake locked (w/54″ min. tread) ..... 9′6″
Overall height (14 x 24 rear tires) ..... 57.72″
Overall length (14 x 24 rear tires) ..... 128″
Overall width (14 x 24 rear tires) ..... 71.38″
Factory installed options include: Equipment Hydraulic Package, 28″ cast iron rear wheels (1200 lbs.), and the new "shift-on-the-go" Select-O-Speed.
Weight with 28″ tires ..... 3800 lbs.
Weight with 28″ tires and cast wheels 5000 lbs.

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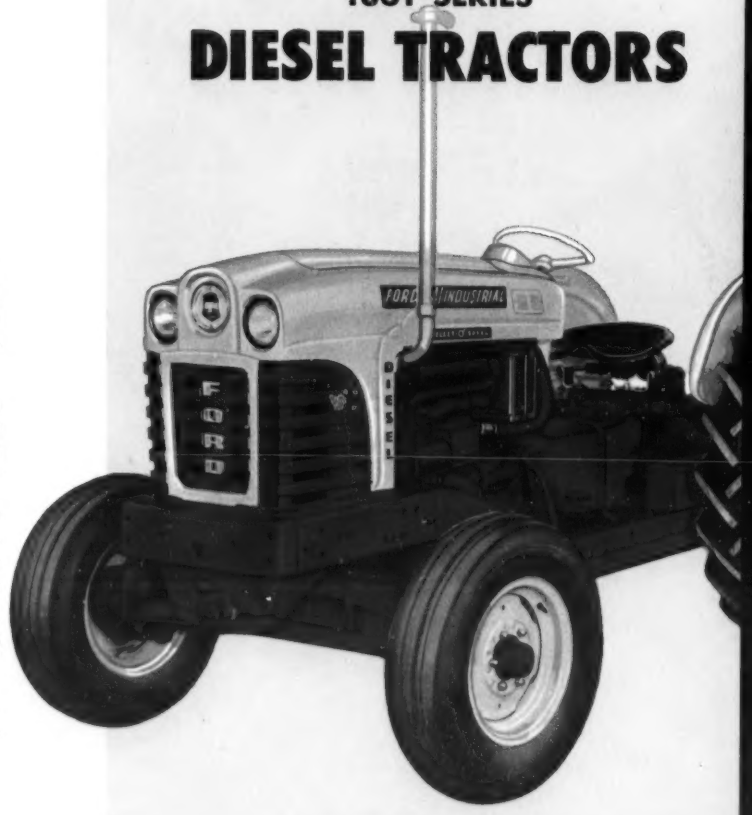
FORD

1801 SERIES

DIESEL TRACTORS



ALL NEW FROM FORD FOR '59

- **For any power job**–Utility, All Purpose and Industrial tractors, gasoline or diesel.
- **For any mowing or maintenance job** – Dozens of man and money-saving implements and attachments, including many specialized tools matched to Ford.
- **For any digging job**–10 ft., 12 ft. and 14 ft. backhoes with bucket and stabilizer pad options for all kinds of digging.
- **For any loading job**–Heavy Duty, Extra Heavy Duty and Super-Duty Loaders with 1000 to 2500 lb. rated capacities.

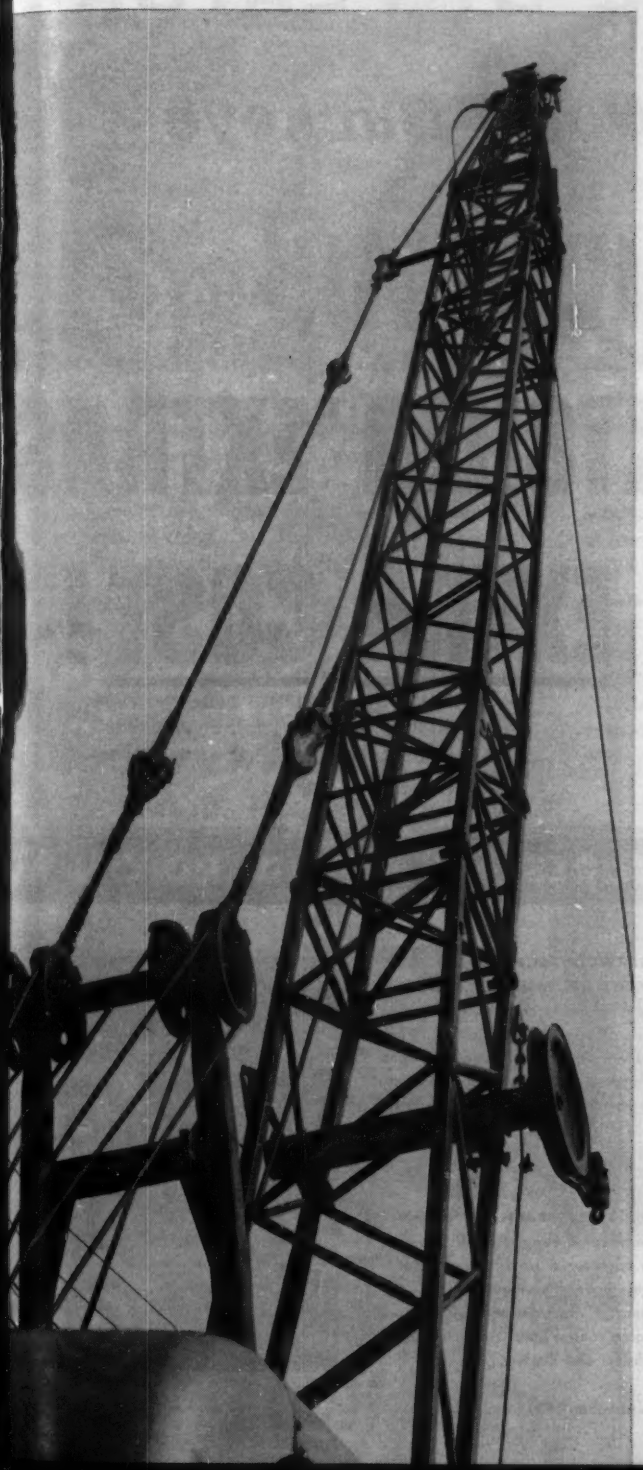
Design, materials and/or specifications are subject to change without notice and without liability.

Ford industrial tractors and equipment can help solve problems, beat schedules and save money on your job, too. Why not talk to your nearby Ford Tractor and Equipment Dealer about easy credit terms? Get full details on all of Ford's new industrial line for '59, on the exciting new Select-O-Speed transmission. See him today, or write Industrial Sales Department, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE
FORDS
BECAUSE THEY
SAVE MORE MONEY!

PRINTED IN U.S.A.

9 years of field service prove safety and long life of Fatigue-resistant USS Tiger Brand Boom Support Assemblies



Nine years ago, American Steel & Wire Division introduced a *fatigue-resistant* Tiger Brand Wire Rope Boom Support Assembly. It was designed to combat the severe vibration on power shovels, draglines and cranes. Since then, it has been installed on thousands of machines with outstanding success.

Effectively dampens vibration. The spliced section gradually dampens vibration instead of concentrating it at one point. This results in greater safety and *much longer cable life.*

Visibility increases safety. With this construction, inspection is easy and the development of broken wires is readily detected. They are not hidden in a shank or socket basket. Thus, you can tell when to replace the assembly in time to prevent accidents.

Easy application. There's no need for extensive alteration of your present equipment. Tiger Brand Wire Rope Boom Support Assemblies are made with standard-size fittings. These are completely interchangeable on standard equipment. For further information, contact our nearest office or write American Steel & Wire, Dept. 9220, 614 Superior Ave., N. W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

Greater safety—20% longer service life was obtained from these Tiger Brand Boom Support Assemblies used on a crane owned by the Hunkin & Conkey Construction Co. in Ohio.

Vibration is effectively dampened by these Tiger Brand Boom Pendants with spliced ends. The splice can be readily inspected for broken wires—an added safety factor.

American Steel & Wire Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Alabama, Southern Distributors
United States Steel Export Company, Distributors Abroad

COMPARE
FEATURE BY FEATURE

Gar Wood-Buckeye

GIVES YOU
MORE DITCHER "EXTRAS
AT NO EXTRA COST!

MODERN FEATURES ARE STANDARD ON AL

GAR WOOD - ST. PAUL TRUCK EQUIPMENT with precision hydraulic system, handles controlled dumping smoothly. It's the most complete line of arm-type, under-body and-front-mounted telescopic hoists, with matching bodies for every job requirement.

GAR WOOD TRACTOR EQUIPMENT matched to rugged Euclid Tractors, is engineered trouble-free performance under the biggest loads. Equipment includes front- and rear-mounted cable control units, Tipdozers, Dozecasters and Rippers.

Why settle for anything less than the "years ahead" features of a Gar Wood-Buckeye wheel-type ditcher ... as standard equipment at no greater cost? Put these *modern* ditcher features to work for you—for lower maintenance costs, increased production and far greater operating versatility:

HYDRAULIC CONVEYOR DRIVE—Three speeds in either direction handle any volume of spoil regardless of digging wheel speed.

HYDRAULIC DIGGING WHEEL HOIST—Allows quick, precise adjustments for depth and grade—independent of conveyor, travel or digging wheel speeds.

MODERN POWER TRAIN—Only Buckeye has a ditcher-designed transmission! Separate output shafts give you more power at the digging wheel.

SIMPLIFIED GROUP CONTROLS—Everything within easy reach of the operator. Hi-Lo traction speed greatly reduces shifting.

SPLIT-SHAFT EXCAVATOR DRIVE—Equalizes drive power to both sides of digging wheel. One of the many examples of Buckeye's unexcelled design.

Only from Gar Wood can you get a modern ditcher ... with extras that are standard at no extra cost. It's well worth your ditcher dollar to compare ... and "go modern" with Gar Wood-Buckeye!

AR WOOD EQUIPMENT

Gar Wood
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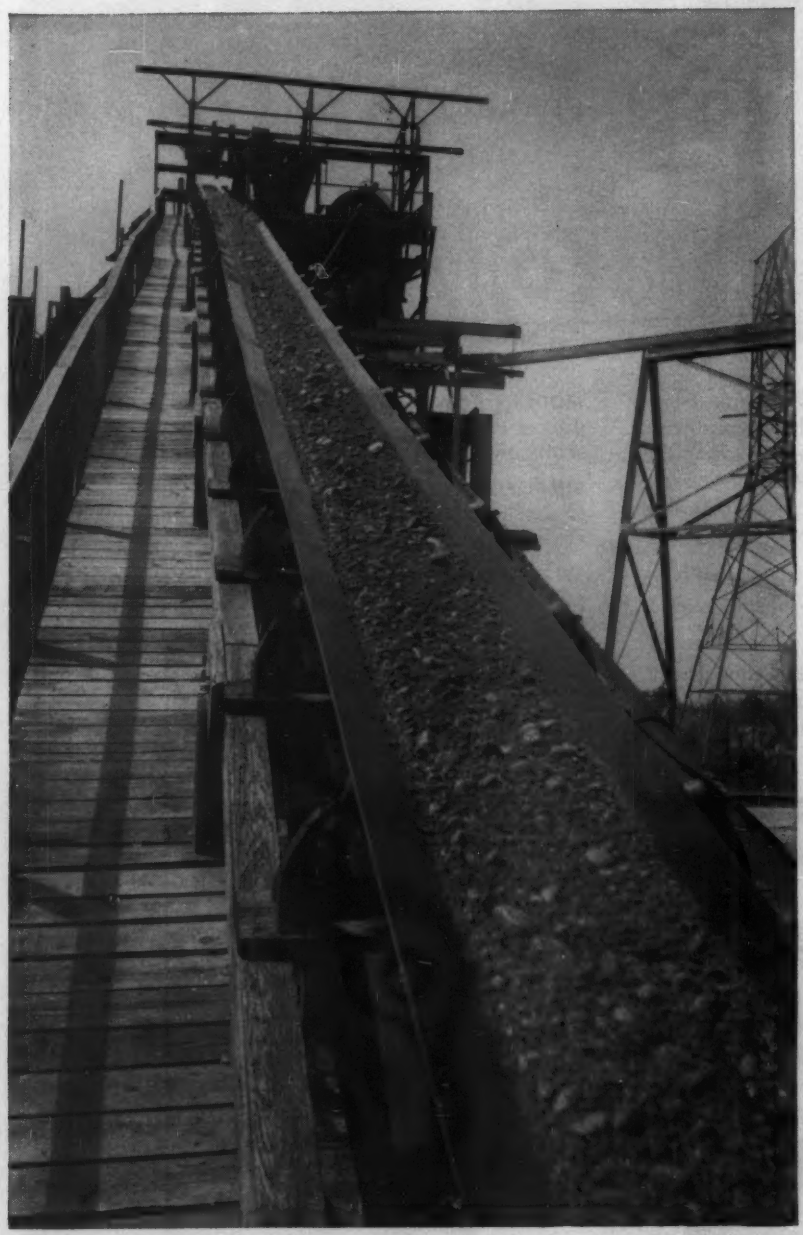
GAR WOOD TRUCK CRANES deliver a smooth flow of precision controlled power. Counter-balanced revolving machinery deck and bogie-mounted hook rollers provide the stability needed for full buckets and fast swings.

B.F.Goodrich

Lasts twice as long— not one repair in 10 years



B.F.Goodrich cord belt stands impact, carries heavy loads further

TONS of sand and gravel dumped on that conveyor belt are carried high into the air to a separator. Heavy loads like this wore out an ordinary belt in 5 years, but this B.F.Goodrich cord belt has already lasted almost 10 years without one repair and practically no maintenance—and it still looks good for several years more.

The ability to stand heavy impact and carry heavy loads long distances is built into the B.F.Goodrich cord belts. Cords running lengthwise, without cross threads binding them together, are surrounded by rubber. They are free to "give" on impact, with rubber taking the shock. Because of this flexibility, the cord belts conform to idlers, pulleys. Spillage is reduced, troughing is natural and belts keep centered on idlers, sustain less damage, require less maintenance.

Good as the record is on the belt in the picture, chances are that it will soon be bettered because of the improvements that are constantly being made in B.F.Goodrich Nycord belts. In recent years, for example, the use of improved rubber compounds and stronger fabrics has resulted in cord belts that last even longer, carry heavier loads, stand even more pounding.

Any conveying operation that submits a belt to punishing impact at loading chute, heavy loads with long centers and high lifts can use B.F.Goodrich cord belts. Your B.F.Goodrich distributor can give you full information. *B.F. Industrial Products Co., Dept. M-690, Akron 18, Ohio.*

B.F.Goodrich ***conveyor belts***

Construction Methods AND EQUIPMENT

SEPTEMBER, 1959

VOLUME 41 • NUMBER 9

HENRY T. PEREZ, Editor

Safety Makes Sense

ONE MAN WAS killed and eight injured recently when a retaining wall collapsed as it was being concreted (picture). In usual construction terminology, such an occurence is called an accident. Accident prevention and safety records generally are based on the frequency and severity of injury to job personnel.

Now, what if there had been no injury or loss of life involved in this collapse? It then becomes an incident. Is an incident a lucky accident, or is an accident an unlucky incident? The definition doesn't really matter for luck should not be allowed to become a factor in the first place.

The contractor cannot afford to gamble. And he doesn't have to. Both accidents and incidents can be prevented by making the job safe. The safe job is the efficient job. It's the one on which things are done right the first time. But safety cannot be a sometimes thing. It demands positive support and vigilance at all times from the top brass right down to the newest apprentice.

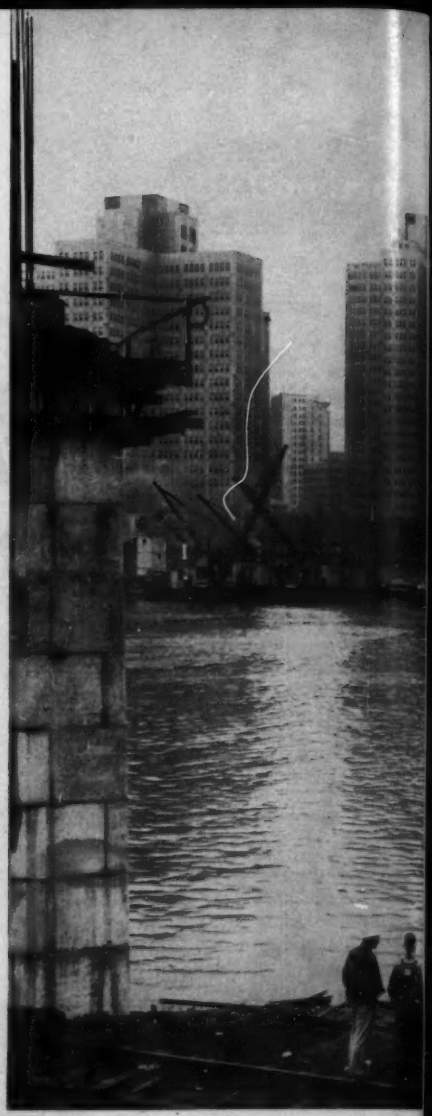
Possibly one of the worst things that can happen is to give merely lip service to safety. A false sense of security leads inevitably to accidents. At least on an out-and-out unsafe job the men are more likely to look out for themselves. But you'll pay dearly for this in lower worker productivity. Under today's labor rates it makes sense to give your men the best tools and working conditions possible so that they can give you a full day's efficient output.

All this costs money, at least in initial outlay. But in the long run it does not. Think of what accidents and incidents cost in damage to work in progress, disruption of schedules, wastage of materials, and loss of productive time of men and machines. Can you afford these losses?

And can you absorb increased compensation insurance costs when bidding on future jobs? Don't forget there can be quite a spread between the insurance rates of an accident-prone contractor and one who keeps his men safe. Just consider what being high up on the credit side of this spread would do to your over-all profit margin.

So safety makes sense from a materialistic view. More importantly, it saves lives and eliminates much human anguish. In this respect you *are* your brother's keeper.

READY FOR POUR—Timber bracing system is in place around top course of granite slabs that will hold concrete for next lift.



FIVE IN ALL—Dravo's contract calls for building two main piers, three smaller approach piers. Slabs function as forms for all.

Frames Hold Granite Forms

There are no conventional timber forms for the exposed upper portion of these bridge piers. The granite slabs facing the piers take their place. A timber frame consisting of two sets of walers held together by steel tie rods holds the slabs securely in place during a pour. By adjusting the length of the tie rods, the contractor fits the frame tightly around the tapering sides of the piers.

SKILL IN CARPENTRY is still something that counts for a lot in forming concrete structures, even though prefab forms are taking over a large share of the field. On the substructure of the Fort Duquesne Bridge in Pittsburgh, the carpenter crew came through with an ingenious frame that holds the granite slabs facing the piers. The contractor was able to pour concrete behind the slabs without using other forms.

Taper Makes It Tough

This isn't a world-shaking innovation, but in this case several complicating factors made the method tougher to apply than usual. The sides of the piers taper inward from the base to the top. The batter of the sloping sides is 3/16 in. in every vertical foot. The bracing frame holding the granite slabs has to be adjustable so that it will fit snugly around the sides of the pier as concreting proceeds upward.

And the piers are an odd shape. The cross section of the pier columns is a square diamond with two oblong trapezoids cut out on two adjacent sides. The result is a shape that resembles an Indian arrow-head. The projecting stem (where the arrowhead would be attached to the shaft) does not extend the full height of the piers. This pilaster ends some 30 ft below the top of the main section,

The three smaller approach span piers are all similar in design, although differing in dimensions. They consist of two columns, typically about 22x32 ft in section, connected near the top by a structural steel strut. Base of the approach pier on the north side is supported on steel bearing piles. The other two piers are founded on rock.

Excavation Is First Stop

Dravo started work at the north main pier. First derrick boats fitted with 1½-yd clamshells excavated silt, sand, and gravel from the river bottom at the pier site. They dredged out about 15 ft of material, leaving a 6-ft-thick cover on top of the rock to seat sheetpiling for a cofferdam. Altogether they removed about 30,000 yd of material for the five river piers.

There were usually at least four derrick boats on hand at the site to excavate, drive piles, and place concrete. Capacity of the rigs varied from 15 to 50 tons. Dravo has a large fleet of marine equipment, and they switch them around from job to job, spotting them where they will do the most good at the time.

The cofferdam for each main pier measures 25x90 ft. Before driving the sheetpiling, the contractor placed a prefabricated steel frame to serve as a driving guide and to brace the interior of

for Piers

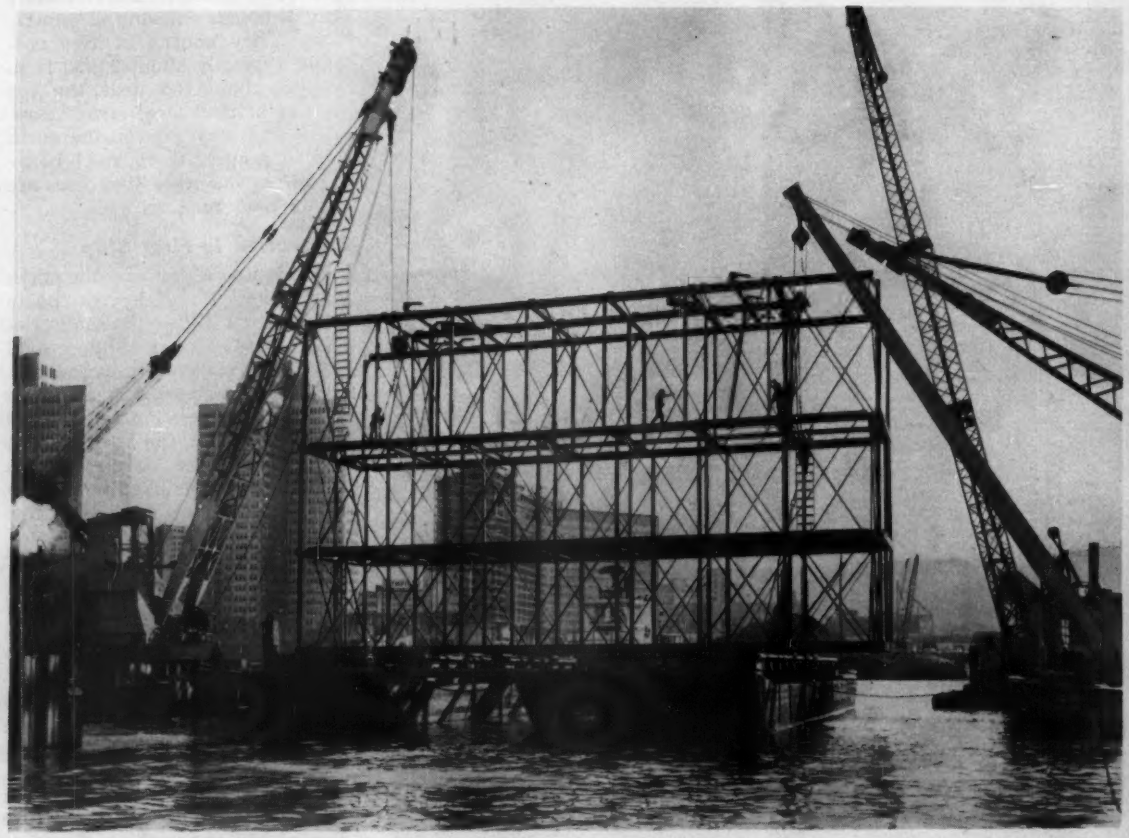
forming a base supporting the lower deck of the bridge.

It's a Big Job

The job calls for building two main piers, three smaller piers, five bents, and two concrete retaining walls. Dravo Corp., Pittsburgh, holds a $2-million contract for the work.

Each main pier consists of two columns, 22x25 ft at the base, joined by a 12-ft-thick concrete strut. The strut is 45 ft long, and extends 19 ft above pool elevation of the river. Foundations of the main piers are set in rock 50 ft below normal river level. One will rise 50 ft above river level; the other, 40 ft.

AT THE START—Derrick boats excavate material from bottom of cofferdams with clamshells. Along south bank of river, cellular cofferdam encloses work on retaining wall.



BIG LIFT—Barge-mounted A-frame and 50-ton derrick boat display their muscles in lifting 112-ton steel bracing frame from barges.

Three-course prefabricated frame serves as guide for driving sheet-piling and braces interior of one of the 25x90-ft main cofferdams.

the cofferdam. A 50-ton derrick boat and a barge-mounted A-frame lifted the 112-ton frame from the barges on which it arrived at the site and placed it in position.

Piledriving at Night

Two barge - mounted rigs teamed up on the pile driving during the day, and one of them kept going through the night. It took about six days to complete a cofferdam for one of the main river piers.

A 15-in. American pump dewatered each main pier cofferdam in about 36 hours. From then on, 4-in. Fairbanks-Morse vertical pumps handled seepage. Dravo kept a 6-in. CMC diesel pump on hand to take over in case of emergency.

After cleaning out the relatively small amount of material at the bottom of the cofferdam, crews with jackhammers cut into the exposed grey shale to a maximum depth of 1 ft to seat the base of the pier in solid rock.

One of the derrick boats handles concreting with a 2-yd bucket. A floating plant equipped with a 2-yd T. L. Smith tilting mixer supplies concrete. Its capacity is about 100 yd per hour. Biggest pour in a single day so far has been 600 yd, but they more often average about 150 yd. The job will take a total of 15,000 yd of concrete.

The granite slabs that face the exposed portion of the piers start about 3 ft below normal river elevation. Up until that point, concrete pours are held by conventional timber forms. Then the bracing system devised by the carpenters to hold the granite slabs securely in place and make them function as forms comes into play.

The granite slabs vary somewhat in size, but all are a uniform 6 ft in height. A typical 4x6-ft, 8-in.-thick slab weighs about 2 tons. Larger slabs that cap the strut between columns of the main piers weigh up to 8 tons.

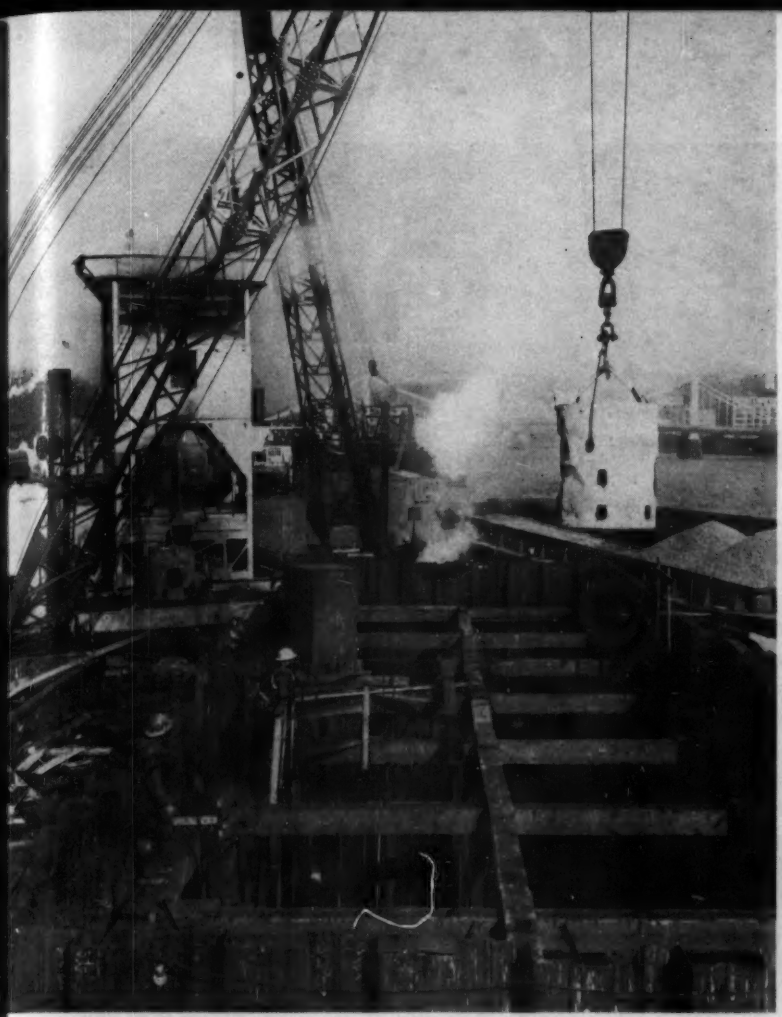
A floating crane places the slabs. When a one-course ring of slabs has been set and the joints mortared, the crane raises the bracing system from the previous, concreted course to hold the slabs securely during the next pour.

Tie Rods Hold Walers

The bracing system consists of two sets of walers that fit tightly around the sides of the pier. Distance between top and bottom sets is 3 ft. Each waler is made up of three 2x8 timbers. A ¾-in. tie rod runs between opposite pairs of walers and holds them securely against the sides of the pier.

On each side of the pier, three 2x6 timber struts form a triangular trussed frame that connects top and bottom walers. Along the cut-out portions at two sides of the diamond-shaped pier, short pieces of 2x6 serve as struts in the gap between the walers and the granite slabs.

Above the top waler, scaffolding supported by timber braces and



DROP IN THE BUCKET—Derrick boat dangles 2-yd concrete bucket that will add its bit to record single day pour of 600 yd for massive base of pier seated 50 ft below on rock.

enclosed by a timber hand railing provides safe room for workmen setting the slabs and pouring concrete.

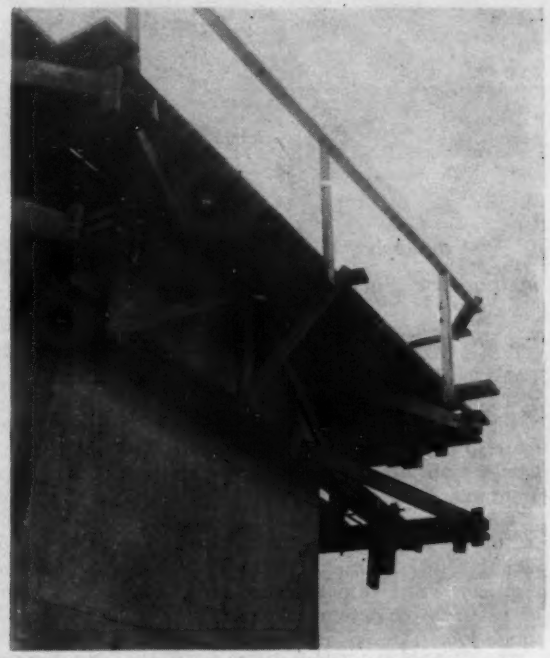
The floating crane hooks onto a cable sling attached to four ¾-in. lifting rods—one at each corner—to raise the bracing frame into poistion. The tie rods are threaded at each end for a length of 12 in. Workmen adjust the length of the tie rods to fit the frame tightly around the decreasing cross-section of the pier. Then the lift is ready for concrete.

Dravo is now putting the finishing touches on the job, getting ready to move out and make way for the steel erectors. They started the job last fall. In spite of two floods that held up work for two months altogether, they got the job done several months ahead of schedule.

Men on the Job

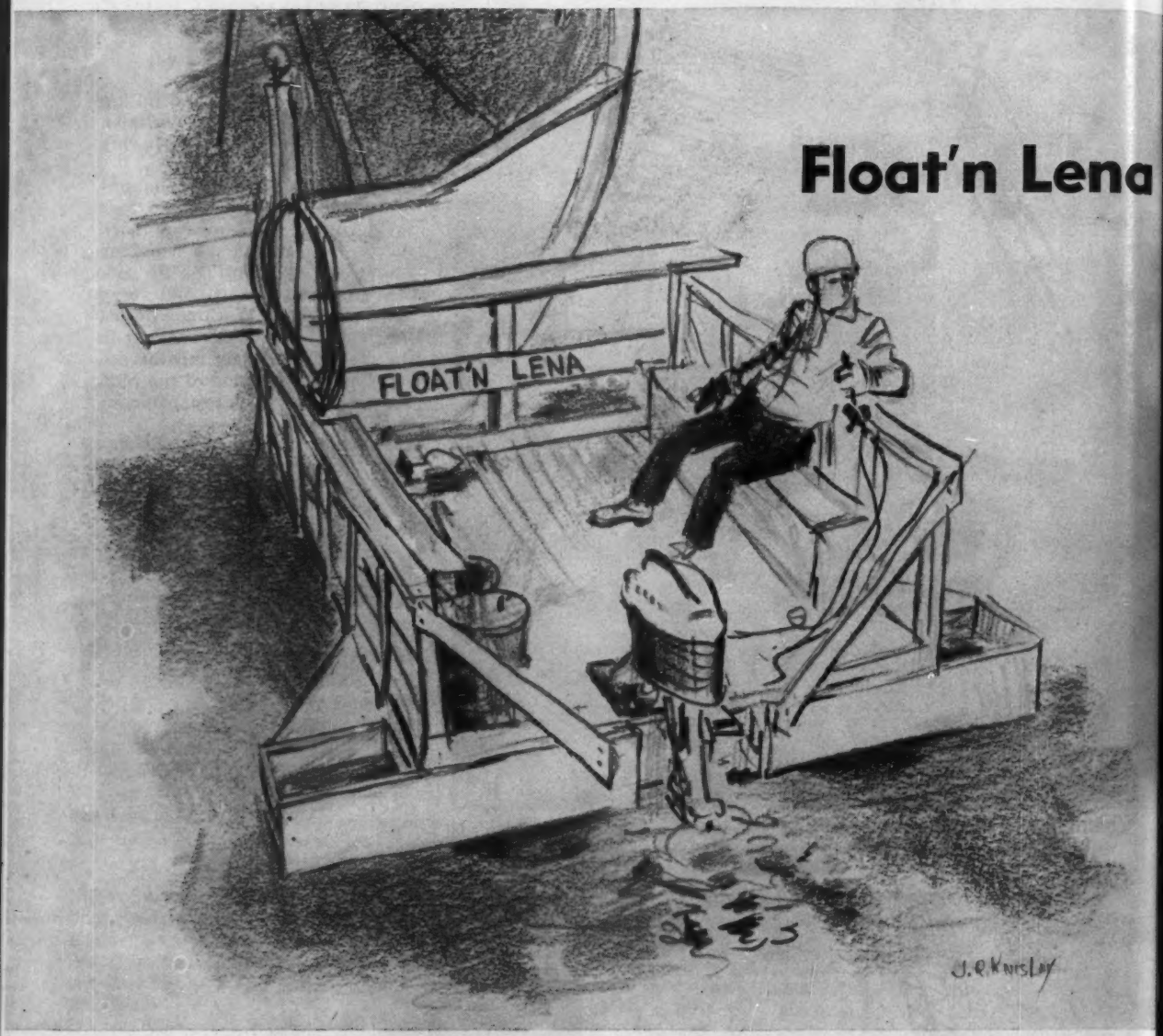
In charge at the site for Dravo is superintendent Ray Hilte. Richard Musall is project engineer; Ed Wright is his assistant. Carpenter foreman is J. C. DuPriest.

RING AROUND THE RIM—Crane lowers granite slab for next ring to workmen on top. Typical slab measures 4x6 ft, weighs about 2 tons.



HERE'S WHAT HOLDS THEM—Two sets of 2x8 walers connected by struts brace slabs. Tie rods between opposite pairs hold walers.

Float'n Lena



A makeshift timber raft powered by a 70-hp outboard motor plays the key role in an unusual method for placing 60-ft-long steel liners in a cramped Fort Peck power tunnel.

OTHER CONTRACTORS thought Chicago Bridge & Iron Company had gotten into deep water when it bid $2-million under the estimate to install tunnel liners for a power plant at Fort Peck Dam in Montana.

They were so right.

But not in the way the rivals meant. CB&I is intentionally using deep water to float itself into an easy way to accomplish a very tough job.

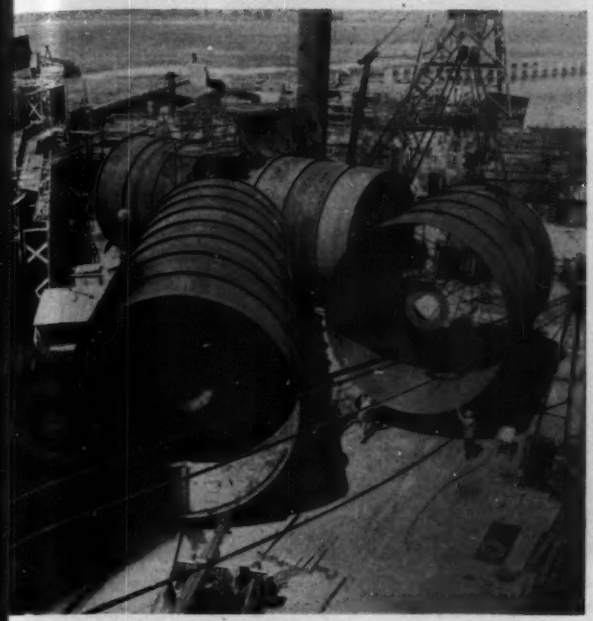
The job's ticklishness stems from Fort Peck's history. The 4-mi-long structure—billed as the world's largest earthen dam—primarily was constructed for flood control in the 30's. Only one of its four tunnels was tapped to produce power, which totals only a modest 85,000 kw.

With increasing demand for power in the Missouri Basin, Army Engineers are stepping up the dam's output to full potential by adding another 80,000 kw of power. This calls for construction of a second powerhouse, installation of two 40,000-kw generators, and tapping of Tunnel No. 2 as an added source of water for power.

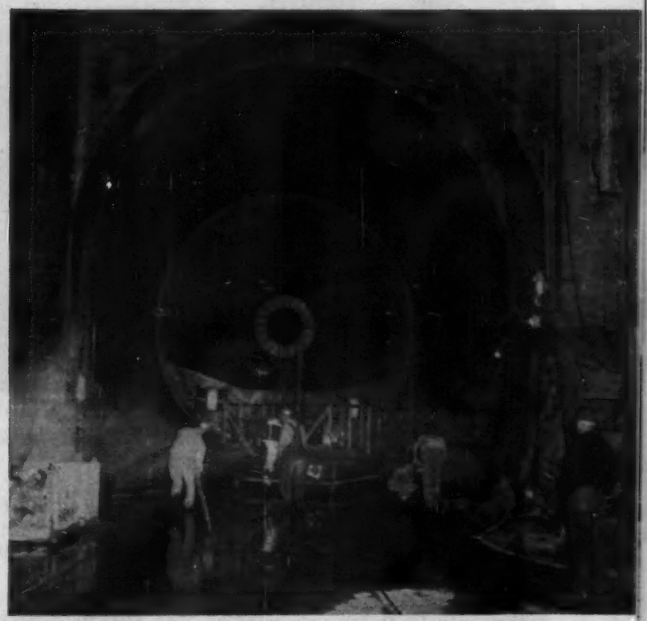
But Tunnel No. 2 is unlined and unable to withstand the massive pressures developed during power generation. To convert it to its new task, the tunnel has to be given a steel liner concreted solidly into place.

This adds up to a big job. Liners must be job-fabricated in 60-ft sections each weighing about 105 tons. And they have to be moved through the tunnel mouth back to the dam's centerline for a distance of as much as 3,716 ft —the length of the portion being lined. Part of this is on a 1,032-ft-

Pilots Tunnel Liners Into Place



MAKE READY—Liner sections 30 ft long are assembled into 60-ft lengths in yard. Bulkheads at bottom of ends will let unit float.



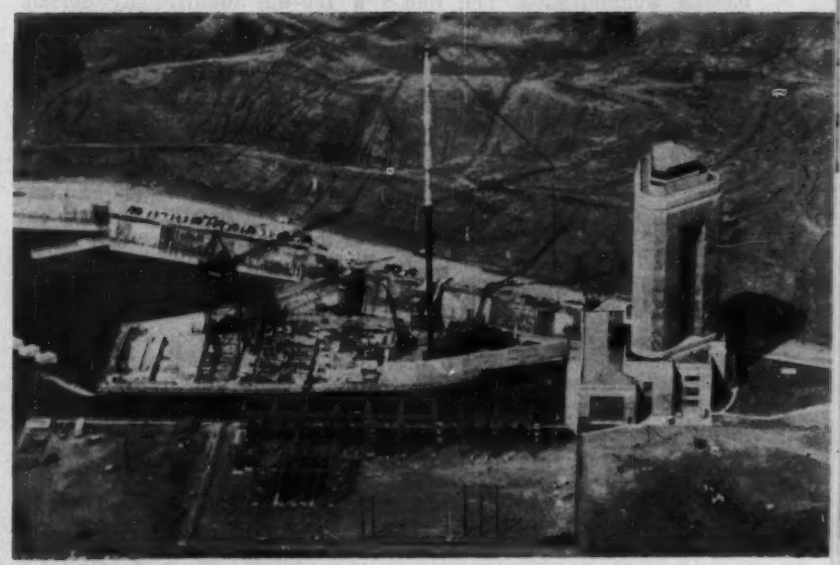
POSITION—Can is pulled 150 ft into tunnel on dollies prior to bulkheading the tunnel to hold water for floating the liner.

radius curve 796 ft long. Another curve is 363 ft long with a radius of 2,566 ft.

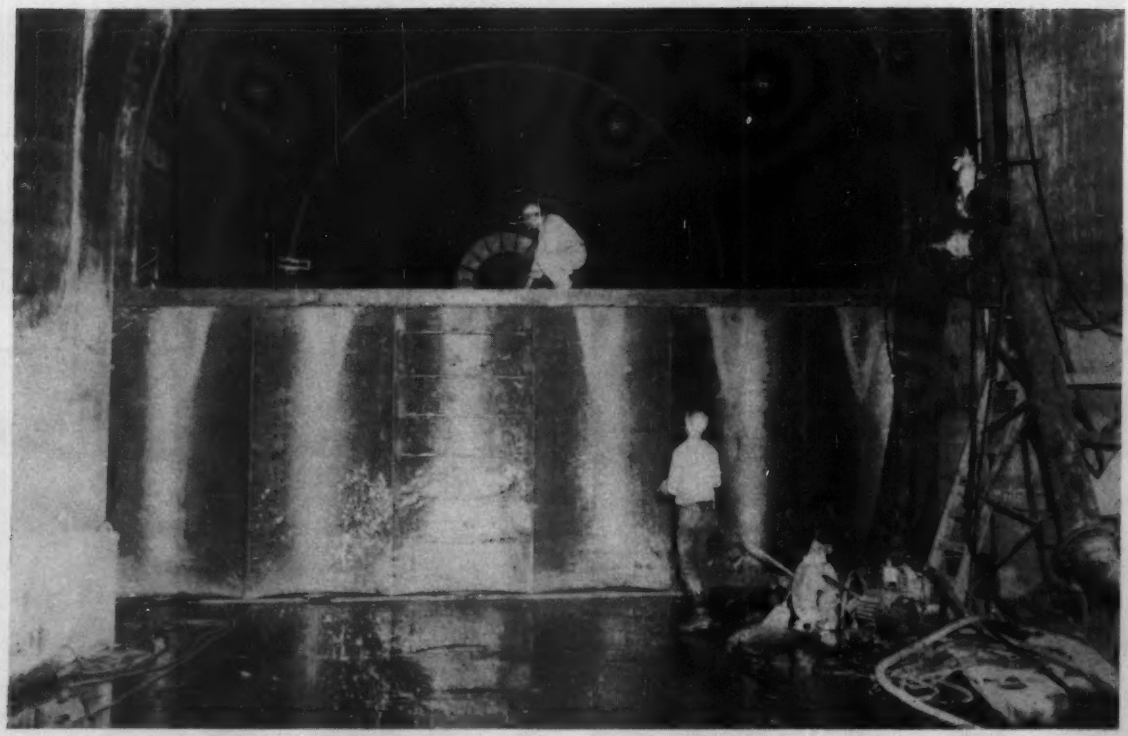
Complicating the lining is the tightness of working conditions. The inside diameter of the tunnel is 24 ft 8 in. The pipe has an inside diameter of 22 ft 4 in. The plate is 1-in. thick. Stiffener rings at 7½-ft centers add another 6 in. to make the over-all liner dimension 23½ ft. This leaves only 7 in. of clear space all around.

Army Engineers, in setting up the job, suggested several methods. These included skidding the cans in on greased rails or some part of a dolly arrangement. CB&I made its $4.6-million bid for the tunnel liner, penstock, and surge tank, on the basis of doing the lining with its own floating-in method.

The flotation is the end of a



AT YARD — Cofferdammed portal area, whose surface is 6 or 7 ft below the river, is a crowded work site where liner sections are fabricated by welding from 10-ft plates.



PLACE BULKHEAD—To seal off the tunnel the contractor drops a 10-ft-high steel bulkhead into stoplog grooves at the portal then pumps in water to float liner.

process that starts with liner fabrication more than 1,000 ft away from the tunnel. The liner sections come to the scene as 10-ft rolled plates. They are welded together into 10-ft-long rings in an off-site welding shop. The roof then is lifted off the shop, which also houses CB&I's automatic welding equipment and X-raying units, and the rings are set on rollers for further fabrication.

Weld Rings

The 10-ft rings are welded together at a rate of three per day to form 30-ft sections. Each 30-ft length of liner is hoisted aboard a war-surplus Sherman tank carrier that hauls it to the edge of the retaining wall overlooking the portal area.

The portal area, whose surface is 6 or 7 ft below the river, was formed by extending the tunnel's training wall with an earth fill, double-bulkheaded timber-sheeted cofferdam secured with walers and ties. It is a blunt-nosed triangle 200 ft at its base, 50 ft across its top (where it joins onto the tunnel portal) and 300 ft along each of its legs. While total space is small, further restrictions come from the many contractors working together in the area.

Derrick Lifts

CB&I's spread is dominated by a 150-ton tubular guy derrick that later will help erect a 250-ft surge tank. The nearby Fort Peck No. 1 powerhouse is Montana's tallest building. But the derrick stands still higher. It is made of tubular steel 6 ft in dia and reaches 367 ft high. Four sets of guy cables at the top and another set of four at the midpoint of the tower are anchored to 45-yd concrete deadmen.

The derrick picks up a 30-ft section from the carrier, parked alongside the retaining wall that forms one leg of the portal area, and lowers it 40 ft into position near the tunnel's mouth. There, it is joined to a second 30-ft section to form a 60-ft can. The can then is prepared for flotation.

Steel bulkheads are secured to each end by pins; joints are made watertight with waterproof tape. The can then is pulled 150 ft into the tunnel on dollies propelled by running the derrick's whip line through a snatch block anchored up tunnel then back to a tongue of a dolly.

When the liner section is ready, the tunnel is made watertight. The contractor drops a 10-ft-high steel bulkhead into the stoplog grooves at the portal. Then enough water is pumped into the tunnel to float the liner section. This requires a depth of 4½ ft.

The tunnel, however, ascends in grade about 1 ft for its length. The last 200 ft also increases 4 ft in dia. So extra water must be added while the can makes its journey to maintain the required floatation depth. Too little water and the can gets grounded. Too much water and it bumps against the tunnel roof.

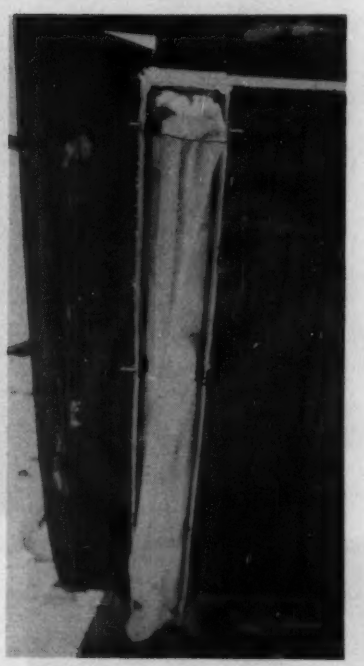
For floating some cans, the water depth reached 10 ft at the gate at the end of the run.

Float'n Lena

Float'n Lena propells the liner section to its final position. It is a timber raft lashed to empty oil drums and powered by a 70-hp Mercury outboard engine. A portable generator provide selectricity for lights that illuminate

Liners Rest on Concrete Saddles

FIT SADDLES — Liner will be jockeyed over 60-deg concrete saddle prepared earlier. When the water is pumped out, the liner section will drop onto saddle.



GROUT CANS — Canvas-covered cans around liner will be filled with grout to form a bulkhead between existing tunnel wall and the walls of the steel tunnel liner.

the tunnel during floatation of the cans. Rollers slipped onto the bow end of the can just above the spring line position and guide it through the tunnel.

At the end of the line, the can is jockeyed over a 60-deg concrete saddle that had been prepared earlier. Lowering the water level sets the liner sections onto the saddle.

An ingenious arrangement prevents the can from floating upward when the 7-in. annular space is filled to concrete the pipe solidly into place. The can's front end is fastened to the previously set one and the seam is welded. This anchors the front but leaves the rear subject to being lifted out of line. This rear area over the saddle is filled with grout retainers to form a tight bulkhead that also resists the uplift from concreting.

These grout retainers are segmental. They are made up of sheet gage steel with open tops covered with loose canvas. They are welded to the stiffeners and butted together with the canvas face out. When grout is pumped into a retainer, the canvas side conforms to the shape of the irregular tunnel wall. This provides solid anchorage, eliminating further tying down of the liner section.

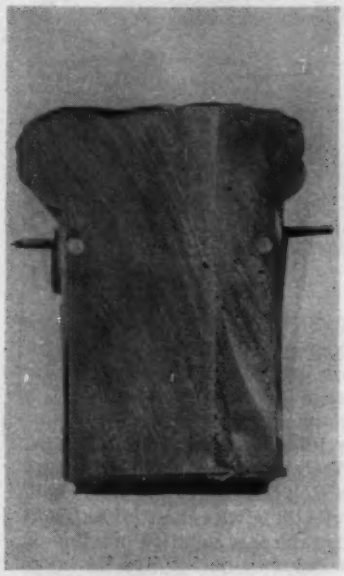
The lining operation, as set up, requires 64 flotations in all. It takes 12 hr to pump the tunnel to flotation depth, 2 hr for Float'n Lena to push in a 60-ft can, and another 12 hr to dry out the tunnel.

CB&I plans to cut down unit cycle time by placing two—and possibly more—cans in the tunnel, then floating them into place simultaneously.

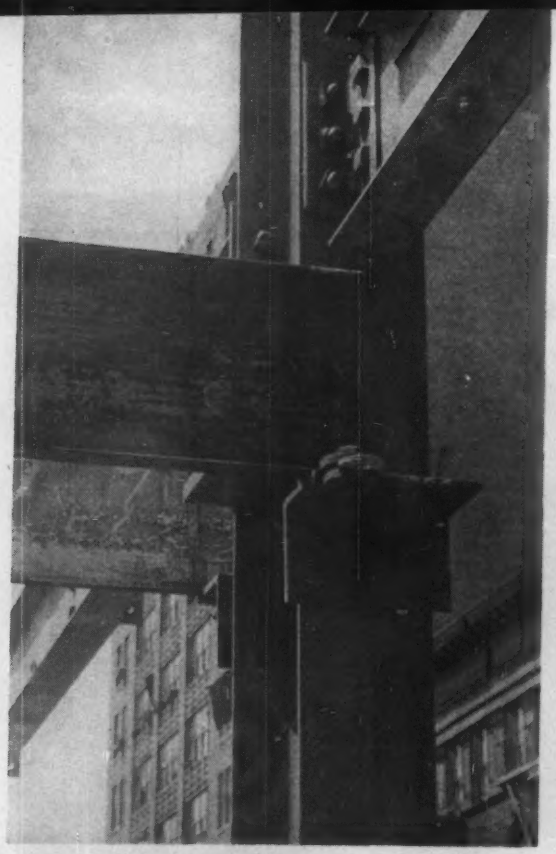
Men on the Job

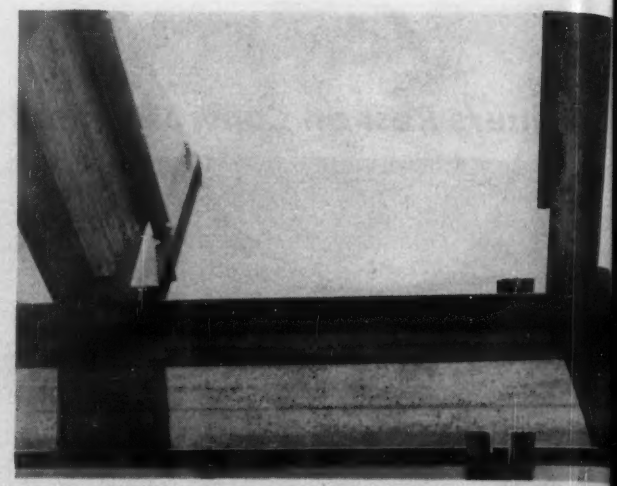
CB&I's project manager is Dave Culver; Chicago district erection manager is F. E. McAtee, while Eldon Brown is foreman.

The Fort Peck powerhouse project is being constructed by the Garrison District, Army Engineers, under command of Maj. Gen. Keith R. Barney of Omaha, Missouri River Division Engineer. Lt. Col. Walter W. Hogrefe of Riverdale, N. D., is Garrison District Engineer, while Captain George A. Nowak of Fort Peck is Area Engineer.



CROSS SECTION—Can is made up of sheet steel with open top covered with loose canvas that conforms to shape of tunnel wall when filled with grout.





CLAMPS ARE KEY—Simple but sure, these clamps—two small heel-shaped steel plates on a ⅝-in. bolt—make this method practical. They clamp the channels running between columns to angle brackets at each end, hold the steel joists on top of the channels

HAND-TIGHTENED — Biting edges of clamp grip flanges of channel and joists.

Take a tour of this job and see a clever framing scheme that combines concrete girders and light steel joists.

Check This Job — It's an Eye-Opener

AT THE START they erect the columns the full height of the three-story building, a parking garage in New York City. The columns stand in an ordered array like flagpoles.

You wonder when they'll start erecting the rest of the steel skeleton—the girders and joists. Then the crane that handled erection of the columns jackknifes its boom and pulls off the job. Now you're really at a loss. What goes on here?

You watch curiously as a crew of workmen begin bolting short pieces of angle to opposite sides of each column just below what you estimate is the height of the first floor. Then a Clark 1-ton fork lift swings away from a stockpile of rusty structural steel with several channel sections. It pulls in between two columns and lifts a channel up to the angle brackets. Workmen bolt the ends of the channel. Then the rig ducks under and lifts another channel into place on the other side of the columns.

When pairs of channel span between columns along both sides of a bay, the fork lift brings over a load of light steel joists from another stockpile and begins placing them across the bay, on top of the channels between columns. Workmen clamp each end of these joists securely in place with a small fastening device that looks like two heavy steel washers on a bolt. The edges of this clamp grip the bottom flange of the joists and the top flange of the channel when workmen tighten the bolt with a hand wrench.

Now the mystery is clearing up. Seems like a pretty slick framing system they have here. Those channels spanning between columns and holding the joists are temporary. They'll serve as side forms for reinforced concrete girders. The ends of the joists will be embedded in the girders. It will be a concrete and steel frame with no bolted connections.

You want to find out more about this unusual system. Soon

Ready for Pour in Just Two Days

FORMING DECK—Workmen swing deck panels up into place between flanges of joists. Cast iron clips on top of flanges hold panels.

FORMING GIRDER—Reinforcing bars tied to inside surface by wires hold panels that form upper part of girder between joists.

you're talking to short, stout Ed Klausner, the man who developed the idea. His company, Kressell Corp., is using the system for the first time on this garage. He gives you a fast run-down on how it works.

"Those joists," Ed says, pointing to a nearby pile, "save us money. About $100 per ton, as a matter of fact. Why? Because there's no fabrication. We order Junior I-Beams directly from the manufacturer, Jones & Laughlin Steel Corp. We tell them how long we want them, and that's all. They cut them to within ½ in. of the length we ask for. That's close enough for us. Maybe we don't get a full 4-in. embeddment at the end of each joist, but we get enough to partially fix the ends. And that means we get away with a lighter section than with a simple bolted connection.

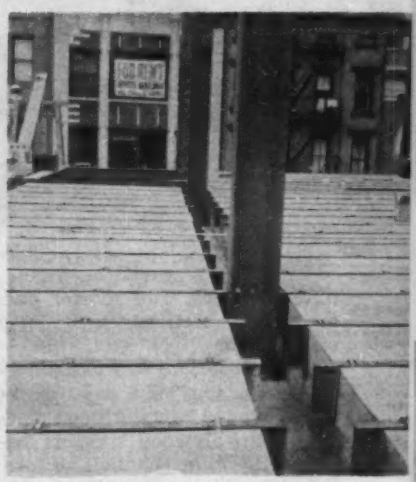
"And here's the gimmick that makes the whole thing practical," Ed goes on, walking over to a barrel and picking out one of the clamps. "A simple thing, but designed especially for this job. See the taper along the biting edge of each plate? That fits exactly the taper of the inside surface of the joist and channel flanges. The plate on top here conforms to the joist taper, the one on the bottom to the channel taper.

"The rough surface of the biting edge makes for a good grip. The biting surface is about 1 x 2 in. The bolt—it's ⅝ in.—holds the two plates tight enough to make every bit of that small biting surface count. The clamps grip so tight that we need only one at each end of a joist. Patented? You bet! We make them ourselves.

"How fast will erection go? Well, with a six-man crew working with one fork lift, we'll put up joists and deck panels for a floor in two days," he replies, sweeping his arm in a gesture encompassing the entire 100 x 175-ft. area of the building. "Concreting will take another two days. We'll do a floor a week easily. And if we had more room to increase our crew we could double that rate.

"And it's cheap. Cost here will run about $4 per sq ft, and that includes everything—equipment, utilities, the whole works. This garage will park 325 cars at a cost per parking space of $1,000. That's one-quarter the cost of many new parking garages going up around here."

You notice with surprise that workmen are already dropping the plywood deck panels into place between the joists. "That hanger that holds the panels is another gimmick I dreamed up, several years ago," Ed says. "It's



JOISTS—Ends of steel joists spanning bays will be embedded about 4 in. into girders.

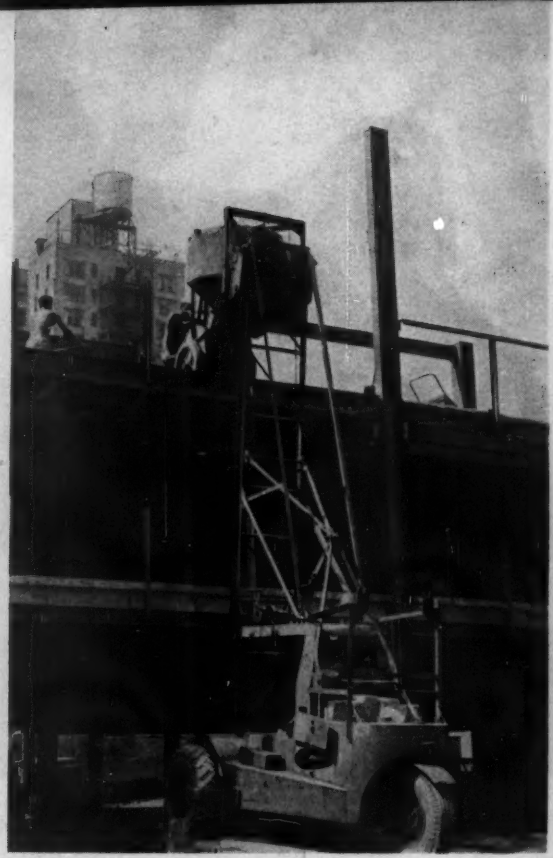
called the K-clip (CM&E, Oct., 1955, p 58). Made out of cast iron. It fits over the top flange of the joist. When the concrete is set you simply slip a pipe over the end sticking out beneath the panel and give a yank. The clip breaks off, and down comes the panel.

"The space between joists is set so a standard size panel will fit between the flanges. That distance is 2 ft, ¾ in. The joists in this bay span 16 ft, in the next bay they span 24 ft. So they are

Concreting Goes Fast— A Floor Every Two Days

INTO BUCKET—Transit-mix truck dumps concrete into ¾-yd bucket of Scoopmobile.

INTO PLACE—Six-man crew places, vibrates, and screeds concrete into 2½-in. thick deck slab. Contractor pours a 100x175-ft floor in two days, placing 125 yd a day.



UP TO DECK—Rig lifts bucket to top of 20-ft mast and dumps concrete into hopper on deck that feeds Georgia buggies. They'll bring in a crane to concrete top deck.

different sizes. The shorter ones are 10-in. sections; the longer ones, 12-in.

"The girders will be two different sizes, too," Ed says as he walks over to two workmen placing ¾-in. plywood sheeting between the twin channels to form the soffit of a girder. "We use 12-in. channels between columns to hold the joists. And they form the lower part of the girder sides.

"There's no problem with the 24-in.-deep girders, but with the smaller 20½-in. size we have to block up the soffit panel from the bottom of the channels with 2x4's. In either case, these hangers clamped to the flanges of the channel hold the soffit panels in place. They're simply two angles fastened together back to back. We put three of those adjustable metal shores under a girder in each bay to hold down deflection during concreting.

"Those men up on top are placing the panels that form the upper part of the girder sides, between joists," Ed points a finger through the lattice of steel joists overhead. "Two short lengths of reinforcing bar tied with wire to the inside surface of the panel hold it in place. The ends of the bars stick out, top and bottom, and hook over the joists below, the deck panels on top. When we strip, we simply cut the wire ties, and the panel pulls off. We lose the reinforcing bars in the concrete, of course, but that's nothing."

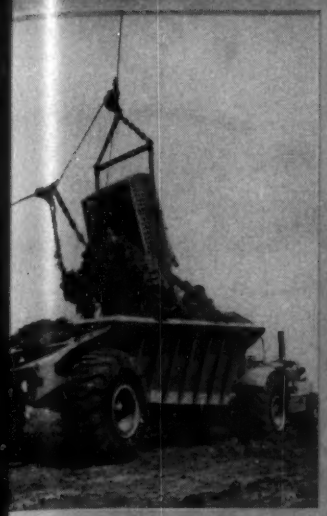
Now you have the story, and just in time. Ed has to hurry off to talk to his superintendent, Max Fain, about steel for the next deck. As you leave the job you marvel at the progress made in a few short hours. This system really racks up a job in short order.

You pass the job a couple days later—they're concreting the first deck already. A Scoopmobile with ¾-yd bucket lifts concrete from street level to the crew overhead. They wheel three Georgia buggies over the deck to the pour area. There a six-man crew spreads it in a 2½-in. layer and vibrates it. The concrete foreman tells you they're averaging about 125 yd a day.

"We'll use the Scoopmobile for the first two decks," he says. "Then we'll bring in a crane to handle the top deck. The Scoopmobile reaches only 20 ft. The mast can be extended, but we don't figure changing it for this one job would be worth it. Besides, we'd have to use a smaller bucket on it then, and that would slow us up. We'll put a hopper on the top deck and feed the buggies from that.

"Come back in another two weeks; we'll have the job cleaned up," he says cheerfully as you turn away. And you believe it.

Here's a demonstration right on this page!



AT THE DRAGLINE, the Cat DW20-PW20 Unit was confined to turning around in a 40-50 foot wide space. Despite the big size of the unit, it was able to make nonstop turns—a great advantage working in close quarters. The wide target of the PW20 helped decrease load time and increase payload.

HAULING, the Cat-built Engine combined with the 10-speed transmission of the DW20 enabled the big rig, with big loads, to negotiate soft haul road conditions for fast cycle times trip after trip. The Caterpillar DW20-PW20 unit's wide base tires provided excellent flotation both on the haul road and at the dumping area.

DUMPING, the PW20's steep sides (18 in. from vertical) and rear door enabled it to shed the sticky material with dispatch. The DW20-PW20 walked away from its load with minimum or no lost time. Use of high-tensile steel in the PW20's construction enabled it to handle heavy payloads.

Get the low-down on the new Cat DW20-PW20 Unit from this time and cost study

THE JOB: Simms Bayou Improvement, Houston, Texas. *Date*—March 13, 1959. *Contractor*—Lee and McKnight Contracting Co., Houston.

JOB CONDITIONS: *Material*—black gumbo and blue clay. *Density*—3000 lb./yard. *Haul length*—3,420 ft. (one way). *Grades*—none (two 90° turns). *Haul road conditions*—first 400 ft. with 300 lb./ton rolling resistance. Balance of haul road maintained—rolling resistance 150 lb./ton. *Loaded by*—dragline with 3 cu. yd. bucket.

AVERAGE LOAD TIME	3.44 min.
AVERAGE HAUL, DUMP AND RETURN TIME	7.17 min.
AVERAGE CYCLE TIME	10.61 min.
AVERAGE PAYLOAD (LB.)	78,633
AVERAGE PAYLOAD IN BANK YARDS AT 3000 LB./YD.	26.31
PRODUCTION ON A 60-MINUTE HOUR	
Trips/hour	5.65
Cu. yd./hour	148.65
OWNING AND OPERATING COST PER YARD	11.85¢
PRODUCTION AT 75% EFFICIENCY	
Cu. yd./hour	111.5
Cost/cu. yd.	15.8¢

The demonstration described and pictured here was made in comparison with competitive units. The new Cat DW20 Series G Tractor with new Athey PW20 Bottom Dump Trailer came through with high production at *lowest cost per yard*. As a result, the contractor purchased a DW20-PW20 Unit.

Consider the facts about this high-capacity rig. The DW20 Series G has a rating of 345 HP (maximum output). It hits top speeds of 35.8 MPH quickly for cutting cycle times. It provides maximum rimpull of 39,565 lb. for unmatched performance on adverse grades. The PW20, constructed of extra strength steel, has a struck capacity of 27 cu. yd.—and a maximum carrying capacity of 40 tons. Here's a matched pair designed to handle *more* work *faster* at *lower* cost per yard than ever.

For the complete time and cost study of this job, see your Caterpillar Dealer. Ask for a demonstration, too. That's the best way to judge what the big new DW20-PW20 can do on your job. Name the place and date—he'll demonstrate!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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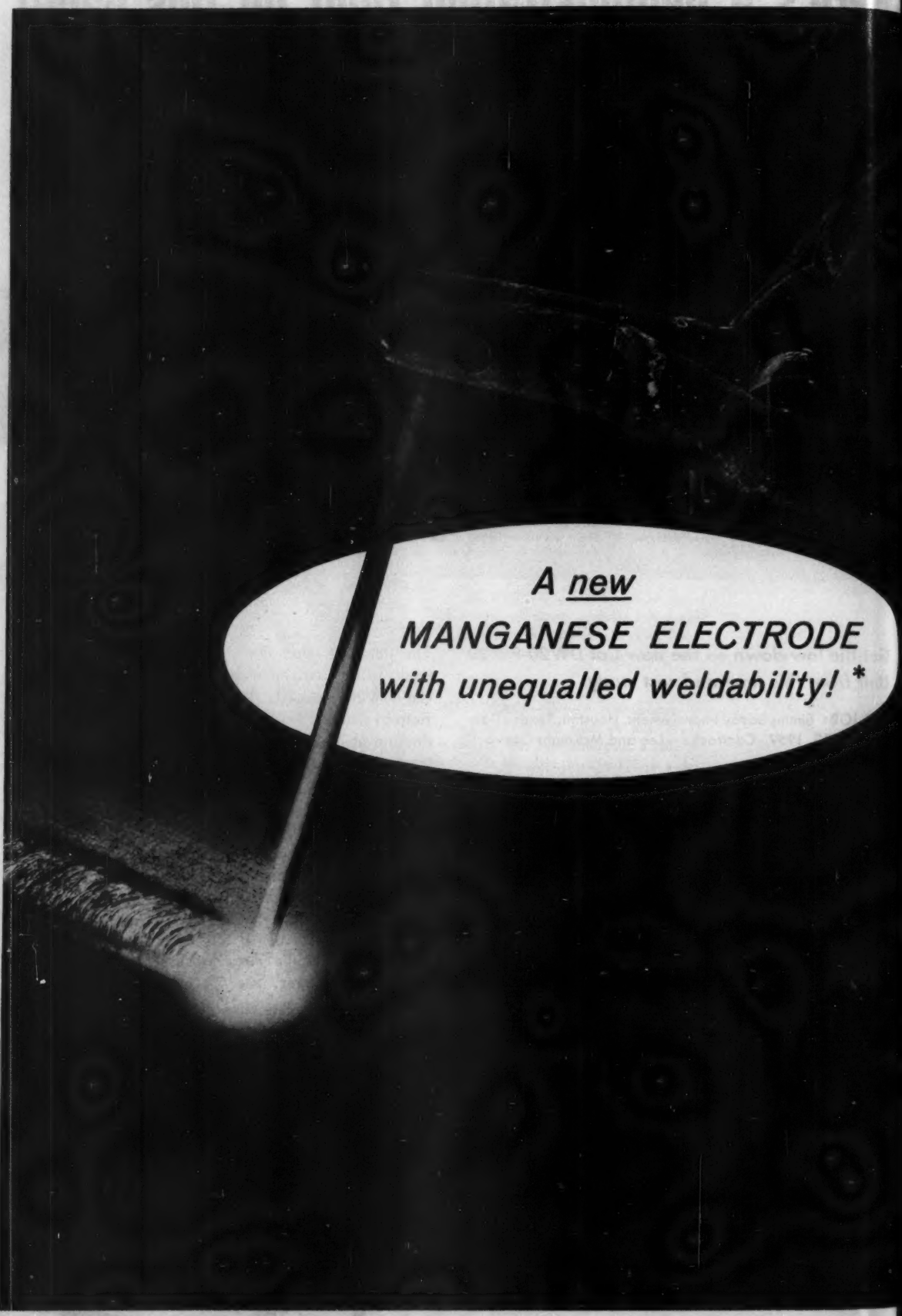
THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS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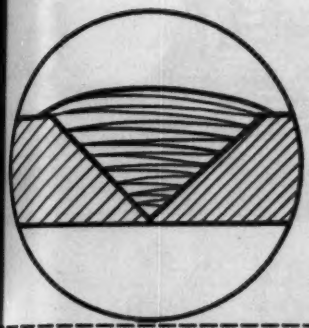
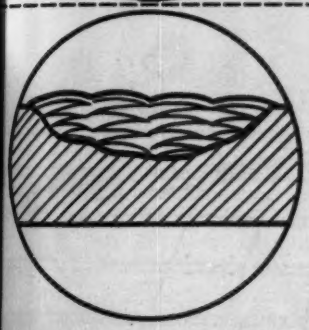
WITH IRON POWDER COATING



FOR JOINING



FOR BUILD-UP!

New Stoody Nickel Manganese electrodes solve manganese welding problems in the field or in the shop! You'll find it unexcelled for joining manganese parts or building up worn areas on manganese equipment. Stoody Manganese is now produced as a solid core wire on which the alloying elements in an iron powder coating are extruded. Unusual welding properties are obtained *with physicals unexcelled in the industry!*

FEATURES:

Stable arc – No popping	Freedom from cracks
Easy re-strike	No porosity
Fast deposition	Easy slag removal
Low spatter	Clean deposits

Cores are uniformly straight and coatings perfectly concentric—insuring a stable, smooth running arc.

Ask your Stoody Dealer for test samples...check speed and welding qualities, *test performance against every other manganese electrode you've ever used...* you'll find Stoody Nickel Manganese provides something *new* and *needed* in the industry!

PHYSICAL PROPERTIES:

(Based on tests by independent laboratory)

	DC Straight Polarity	DC Reverse Polarity
Tensile Strength	119,000 psi	111,000 psi
Yield Strength	67,000 psi	66,000 psi
Elongation in 2"	55%	37.5%

Hardness—Single pass on manganese steel;
as deposited—15 Rc, as work-hardened—48 Rc.
Two passes on manganese steel;
as deposited—18 Rc, as work-hardened—48 Rc.

*Be sure that your Maintenance Superintendent and Welding Foreman see this announcement!

Call your Stoody Dealer—check the Yellow Pages of your phone book or write for list of dealers serving your area.

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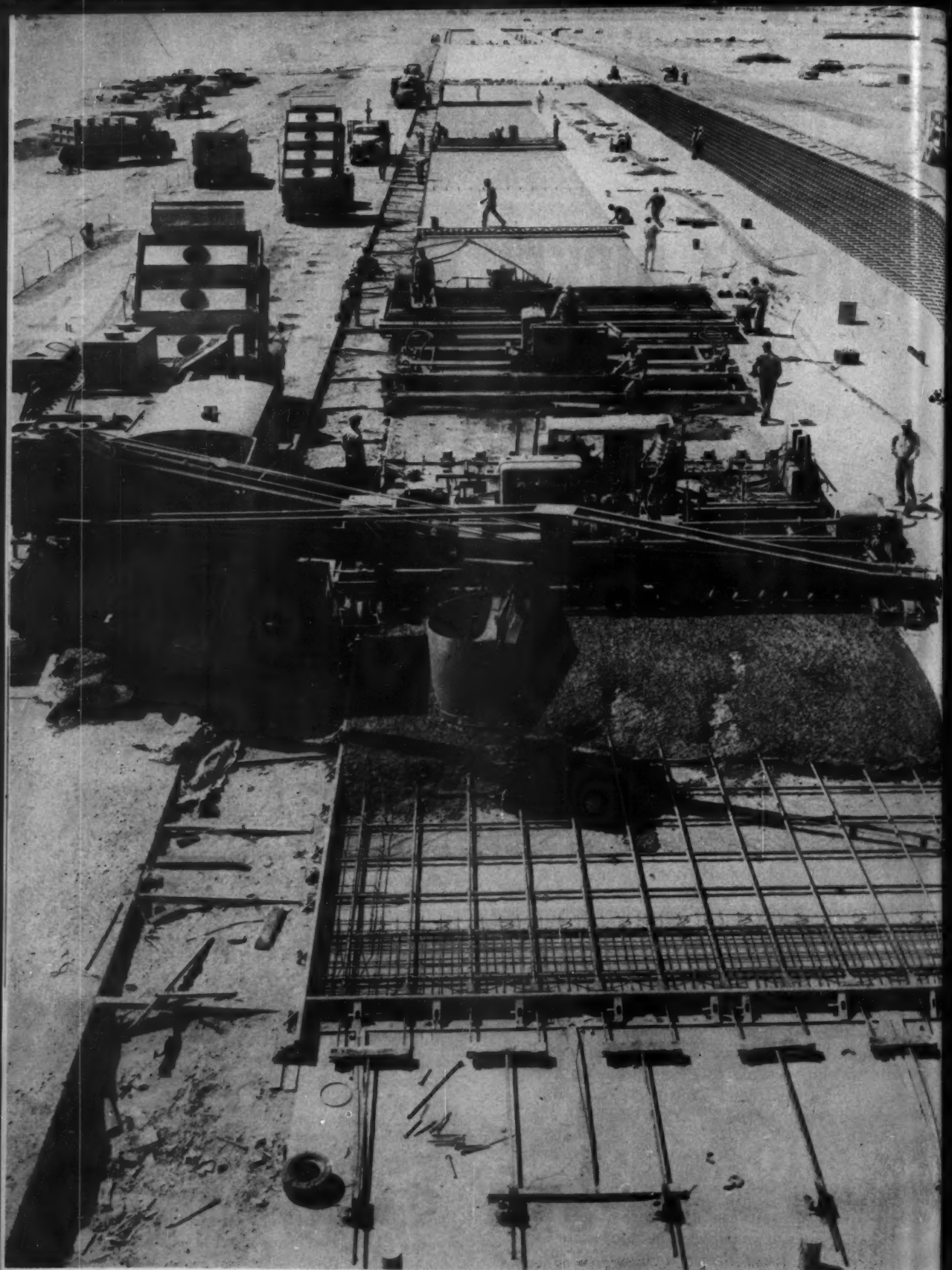


PRESTRESSED PAVING—Paving train pours the second of three prestressed lanes at Biggs AFB. Center lane already has been completed, far lane is ready for paving. Yoke arrangements in foreground were used to pretension slightly the longitudinal tendons. These tendons and the transverse tendons later will be post-tensioned.

Prestressed Pavement Makes Debut on Air Base

A Texas contractor has the distinction of being the first outfit to lay a major section of prestressed pavement on a U. S. airfield. It is part of the modernization of Biggs AFB.

FOR THE FIRST TIME in construction history a contractor has laid a stretch of prestressed concrete pavement that represents an important part of a permanent airfield. It could be the fore-runner of a major development in paving technique.

The prestressed pavement is part of a $7-million enlargement of Biggs Air Force Base in El Paso, Tex., so it can handle big jet bombers. H. B. Zachry Co. of San Antonio, Tex., were the contractors. The Albuquerque district of the Corps of Engineers were construction agents for the Air Force.

The Corps of Engineers wanted to find out how prestressed pavement compares with conventional types in performance as well as in construction costs and techniques. So they designated one of the new taxiways at Biggs "demonstration taxiway T-3" and designed part of it with prestressed concrete and the remainder with conventional pavement. In this way they can compare the two types under identical conditions.

Taxiway T-3 runs north and south and is about 5,300 ft long. From south to north it consists of the following sections:

- 550 ft of conventional non-reinforced concrete 24 in. thick. There are three 25-ft lanes with control joints every 25 ft.
- 1,550 ft of prestressed concrete 9 in. thick. This stretch has three 25-ft lanes with control joints at intermediate grade beams and expansion joints every 500 ft.
- 1,550 ft of reinforced concrete 19 in. thick. There are three 25-ft lanes with control joints every 75 ft.
- 1,625 ft of plain concrete the same as the first section but only two lanes wide.

All the pavement is underlaid by 6 in. of stabilized aggregate base course compacted to 100%, 6 in. of subgrade compacted to 97%, and on the bottom, 6 in. of subgrade compacted to 92%.

Prestressed Section

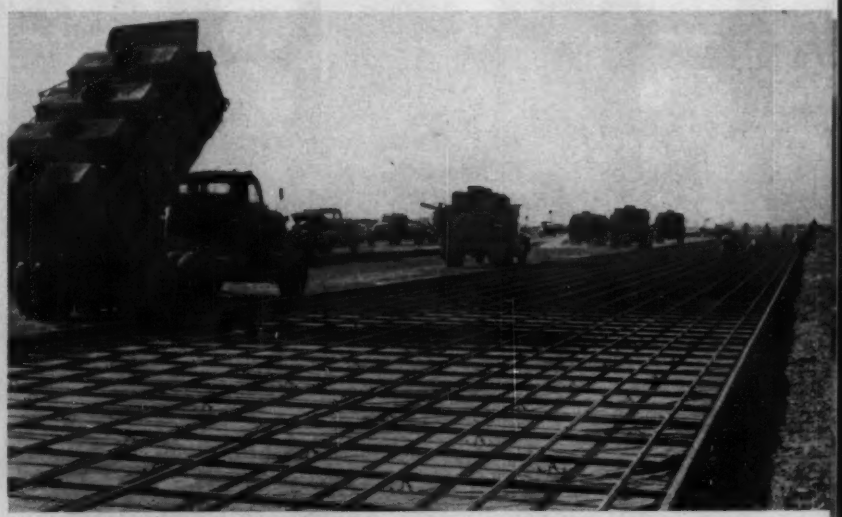
The 9-in. thick prestressed pavement is divided into three 500-ft lengths for convenience in stressing the longitudinal wires. The ends of each 500-ft section rest on grade beams that support the slabs, provide working space for tensioning the wires, and help anchor the wires during the initial pretensioning.

There are longitudinal and transverse prestressing conduits, both of which contain individual wires. The longitudinal conduits are slightly pretensioned before concrete is poured, then post-tensioned after the pour. The transverse conduits are entirely post-tensioned.

Zachry paved the center lane first, then the outside two. To reduce friction between the bottom of the slabs and the ground, they laid ½ in. of sand on the base course and covered it with polyethylene film. The concrete went in on top of the film.

Zachry put in the transverse tendons first. They were rigid conduits containing six wires and were spaced at 27-in. intervals along the lane. Bearing plates bolted to the forms supported the ends of the conduits. In between, they rested on chairs.

continued on page 114



READY FOR PAVING—Workmen finish tying rigid transverse conduits to flexible longitudinal conduits just before paving starts. Chair supports hold up transverse conduits.

How Standard Oil Provides Support For A Bridge Builder

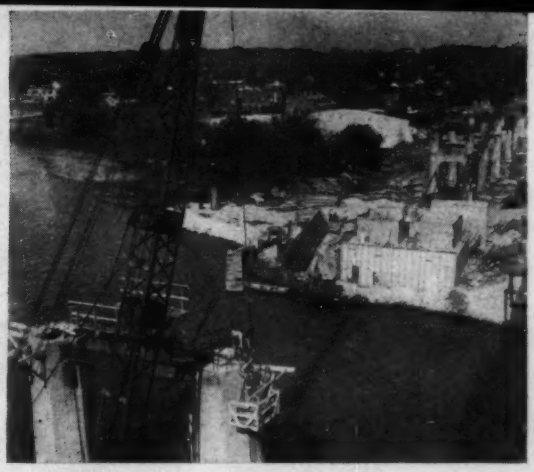
Dravo Corporation builds Mississippi River span at Bettendorf, Iowa, gets lubricants, fuels and technical service from Standard Oil

The new, two lane span Dravo is building is an addition to the two lane bridge 72 feet upstream which, until now, has carried all of the U.S. Highway 6 traffic across the Mississippi. Right there to lend support to Dravo is Standard Oil.

Standard Oil storage facilities for the fuels and lubricants are located at Davenport, less than ten miles from the construction site. Standard's Harold Jansen lives in Davenport. He's nearby at all times to render lubrication technical service.

Here's what this means to the contractor: Inventories of lubricants and fuels at the job can be kept to a minimum, yet there is never any waiting for supplies of these products. A trained engineer with ten years' experience in such work is on hand to help maintenance men get the best possible service from equipment. The men who are operating equipment on the job can depend upon the lubricants, greases and fuels being the very top in quality.

Is this the sort of service you want from a supplier? Get it by calling the Standard Oil lubrication specialist near you. There are 48 Standard Oil district offices and nearly 3,600 storage and warehouse points in the 15 Midwest and Rocky Mountain states served by Standard. One of them is near your job wherever you are. **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

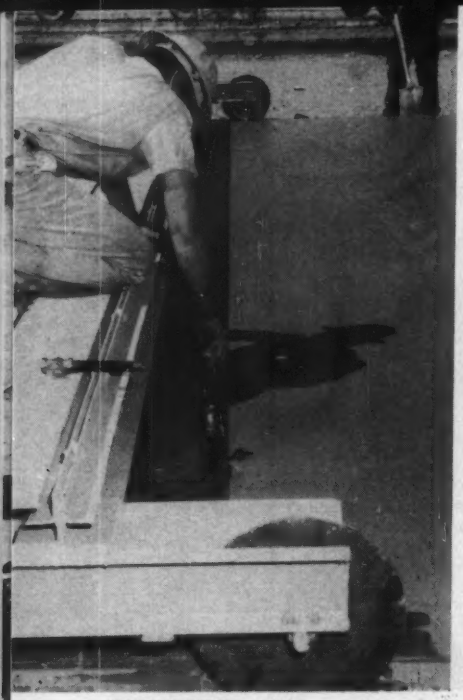


End of a bottleneck. New 5,504 ft. bridge will be supported by 35 concrete piers, 11 in water and 24 smaller ones on land plus abutments and two anchorage piers.

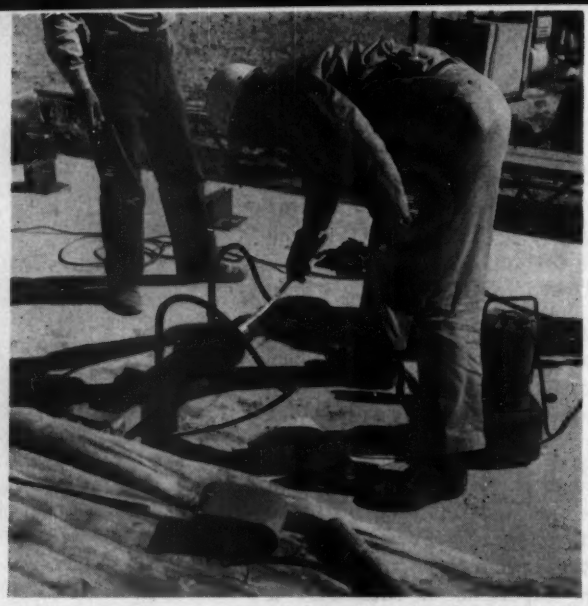
STANDARD

You expect more from Standard and you get it!

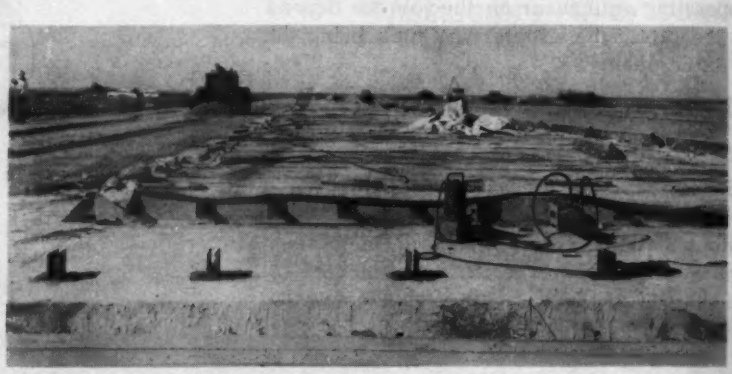
Harry Kraus, Dravo superintendent, and Standard's Harold Jansen have a look at the lubrication literature. Harold Jansen knows his way around a construction site. He's been doing work of this kind for ten of the thirteen years he's been with Standard. Harold has special diesel training and has completed Standard's Sales Engineering School.



GROUT PIPES—While concrete is fresh, man screws the grout pipes into conduits.



JACKING—Workman measures elongation of wires during first post-tensioning stage. A jack force of 20,000 lb stretched the wire about 7½ in.



CURING—Hot weather made curing tricky. First step was to lay cotton mats over the slab and keep them wet for 24 hr. Later the contractor sprayed on a curing compound.

PRESTRESSED PAVEMENT...

continued from page 111

Next the longitudinal conduits went in. These were flexible conduits containing 12 wires each. There were 13 in each lane and they were set 4½ in. above the ground, exactly in the middle of the 9-in. slab.

A workman straightened the longitudinal conduits two at a time with a yoke attachment and a lever anchored to the grade beam. At the same time he put a 10,000-psi prestress in the wires by tightening a nut on the yoke. This lengthened the wires about 2 in.

The longitudinal conduits rested on the rigid transverse conduits and were partially supported by them. The two systems were also wired together at intersections. A regular paving train poured the concrete.

Immediately after the screed passed over, workmen dug into the fresh concrete at 100-ft intervals to screw ½-in. dia grout pipes into the flexible conduit. The conduit previously had been fitted to take the pipes. Then they hand finished the disturbed concrete around the pipes. The grout pipes were used later to pump pressure concrete into the longitudinal conduits.

When the concrete reached a strength of 870 psi (this usually took about 24 hr), the first stage of longitudinal post-tensioning began. Jacks put a 20,700-lb load on the wires to stress them to 35,100 psi, elongate them 7½ in.

At this point the forms were removed and the whole process was repeated for the outside two lanes. When the concrete in all three lanes had reached a strength of 4,050 psi, the crews finished the second state of longitudinal post-tensioning for all three lanes.

They first put on a 2-min overstress of 192,000 psi (representing a jack pull of 113,000 lb) that elongated the wires 18 in. Then they anchored the wires at a tension of 168,000 psi with the elongation just under 18 in.

Next, the crew fed the transverse wires through the conduits, and post-tensioned the transverse wires right across the three lanes. They put on a 2-min overstress of 180,000 psi and anchored the strands at a stress of 168,000 psi with an elongation of 5½ in.

Before they released the jacks, they pressure grouted all conduits. They pumped the concrete through the pipes at 100-ft intervals to fill the longitudinal conduits. All the concrete for the shorter transverse conduits went in the ends.

After the post-tensioning was finished, the concrete crew poured a reinforced concrete slab 9 in. thick to fill the 15-ft long gap between the prestressed sections. They separated the reinforced concrete from the grade beams with waterproof paper.

Air temperatures of 100 deg complicated the curing process. Zachry turned a spray of water onto the fresh concrete. Then they rolled cotton mats over the concrete and kept the mats wet for 24 hr. Finally they sprayed on a curing compound.

J. W. Lowe, Jr. was project manager for Zachry. F. O. Reeves was resident engineer for the Corps of Engineers.

HOW TO HANDLE WET JOBS

#50 of a series

Project: Pumping Station, New Brighton, Penna.
Consulting Engineer: Michael Baker, Rochester, Penna.
Contractor: Engstrom & Wynn Company, Wheeling, W. Va.

Soil bouldery, sheeting impractical; wellpoint system solves tough ground-water problem as . . .

New-type Holepuncher Installs Wellpoints

Patent applied for

Since the work site consisted of coarse sand and gravel with many boulders, Engstrom & Wynn were faced with a very difficult and expensive job if they chose to drive a steel sheet pile cofferdam to handle their ground-water problem.

• **They were satisfied,** as was the consulting engineer, that a system of Griffin's extra-capacity "Aquahog" wellpoints would control the ground-water volume, but there remained the question: could the wellpoints be installed through the obstructing boulders?

• **The photo shows** the answer: successful installation achieved with a new "sliding-weight" holepuncher* developed by Griffin engineers. 16 ft of ground water was lowered without difficulty.

• **Using open cut** and wellpoints installed with the new holepuncher, the contractor's cost proved to be just a fraction of what it would have been with sheeting. This same economical Griffin method has recently been used at Titusville, Oil City and Warren, Penna.

*Patent applied for

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That's why there's a minimum of maintenance with this hardy pipe. It reduces treatment loads and costs. Requires fewer periodic inspections and cleanings.

There are five classifications of "K&M" Asbestos-Cement FLUID-TITE Sewer Pipe to meet your crushing strength requirements. To simplify planning and design.

Eliminate the problem of infiltration with tested and proven "K&M" Asbestos-Cement FLUID-TITE Sewer Pipe. Write to us today.

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Size Inches	Class 1500	Class 2400	Class 3300	Class 4000	Class 5000
6	1500	2400	3300		
8	1500	2400	3300		
10	1500	2400	3300	4000	5000
12	1500	2400	3300	4000	5000
14	1500	2400	3300	4000	5000
18	1500	2400	3300	4000	5000

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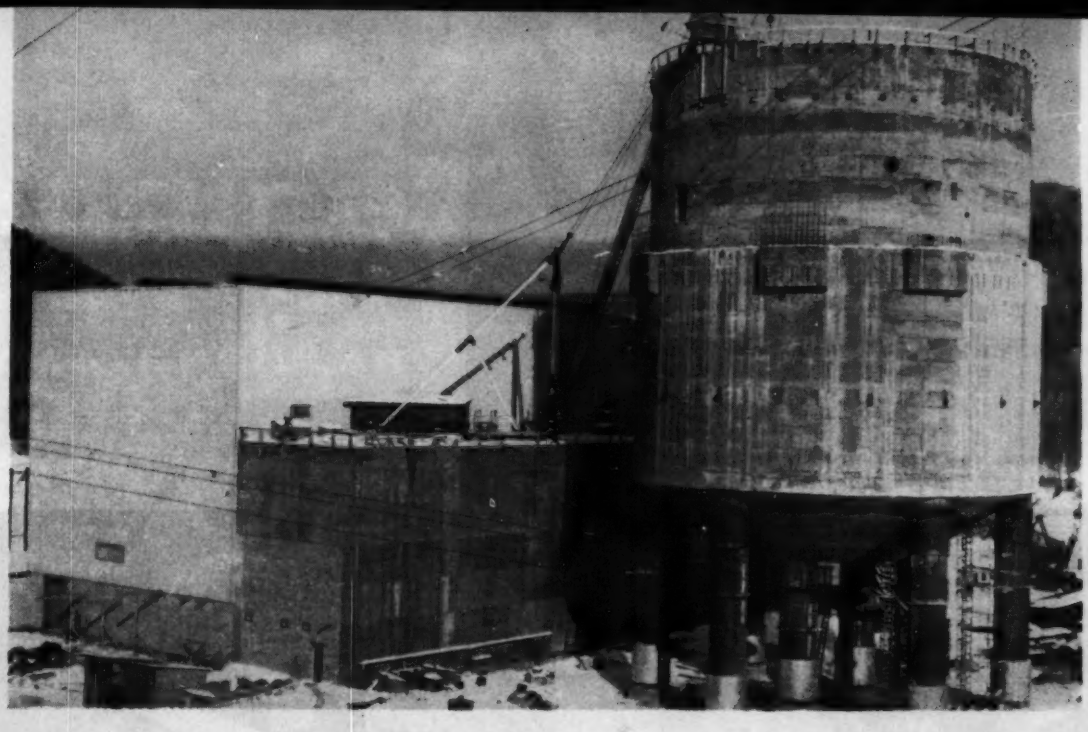


Here's a Tough Concrete Job

But a variety of rigs and smart job planning team up to place 5,000 yd of concrete into the 5-ft-thick walls of an atomic reactor shield 125 ft high.

IT TOOK a stiffleg derrick, two big cranes, and a Pumpcrete machine to place the 5,000 cu yd of concrete for the reactor shielding structure of the Yankee Atomic Electric Co.'s $50-million nuclear power plant at Rowe, Mass.

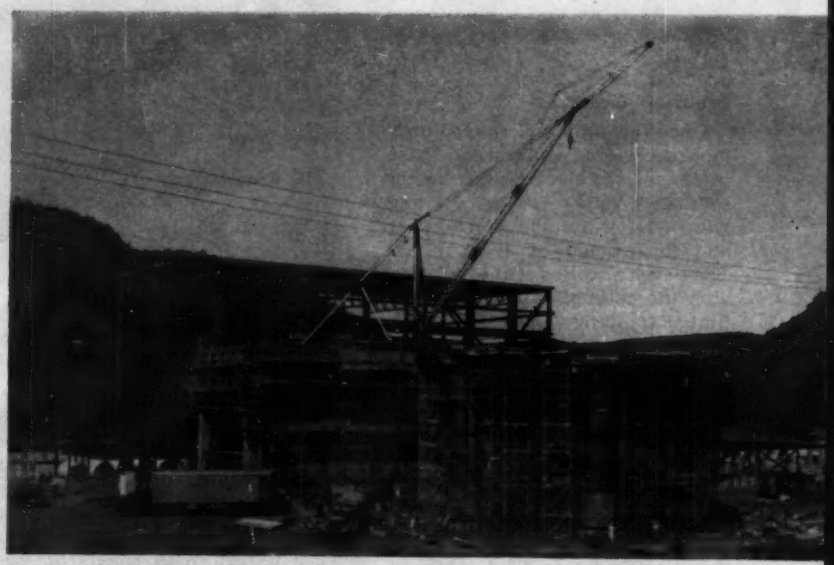
One reason concrete handling was a problem is that the shield structure is 25 to 125 ft above ground level, resting on eight concrete-filled steel cylinders. This design will make it possible for railroad cars to roll under the reactor for loading.

Another reason is the complex shapes of the massive concrete shield. It consists of a conical shaped bottom slab that averages 5 ft thick, a circular outer wall 82½ ft in dia and almost 80 ft high, and a similar but lower inner wall.

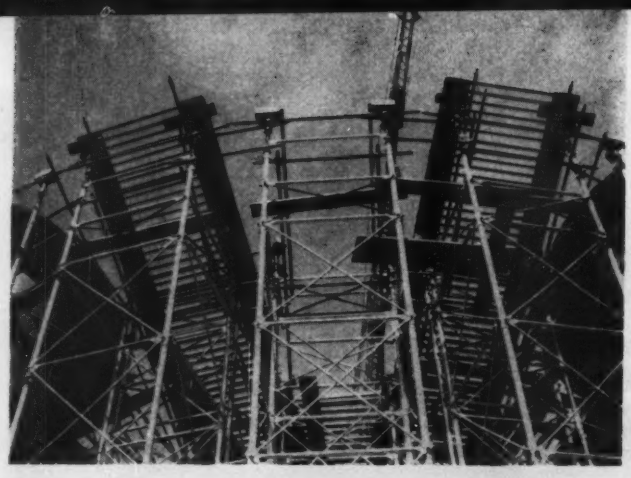
Planning

Stone & Webster Engineering Co. of Boston, designers and contractors on the project, figured the most efficient way to concrete the shapes would be in 11 separate stages. This would best exploit the available forms and equipment.

To handle materials, the contractor mounted a 25-ton stiffleg derrick atop the concrete roof of an adjacent control house. Its 39-ft mast hung over the 50-ft-high shield wall separating the control house from the reactor structure. Its 90-ft-boom, fitted with a 20-ft jib, could reach out to any point to place most of the concrete. The



RAISE SHORING—Patent heavy duty tubular steel scaffolding towers set between steel column cylinders support forms for first stage pour—a heavy, saucer-shaped slab.



SET STRINGERS—Adjustable U-heads screwed to top of tower legs seat 8x16-in. timber stringers bridged over with 2x8-in. wood joists set on their sides.

LAY DECKING—Sheets of ⅝-in. plywood decking conform to sloping shape of 5-ft-thick slab which will support the massive walls of the reactor shield.

A TOUGH CONCRETE JOB...
continued

PLACE REINFORCING—Stiffleg derrick and two cranes place the 222 tons of reinforcing steel for the 5-ft-thick bottom slab. The slab required 1,046 cu yd of concrete.

stiffleg derrick was supplemented by a 60-ton Manitowoc 3900 crawler crane with 80 ft of boom and a 30-ft jib and a Manitowoc 3500 with 100 ft of boom and 20 ft of jib.

Erecting Columns

Once the eight concrete column footings were poured and base plates set, the steel casings for the columns were erected. These were 38-ft-high shells, 7½ ft in dia, constructed of ⅜-in. plate. They were rolled into position atop the column base plates over timber cribbing.

The stiffleg derrick raised each into place over the base plates where workmen butt-welded the connections. Each shell had shear lugs welded inside it near the base. Drypacking the space between the lugs and the base plates held the column plumb.

To support forms for the slab, the contractor set up a series of towers of Patent Scaffolding's 3½-in.-dia tubular frames, over 2-in. mudsills. Tops of the towers were fitted with adjustable U-heads that served as seats for 8x16-in. timber stringers. The contractor bridged the stringers with 2x8-in. wood joists set on their sides 6 in. on centers. Joists were topped with sheets of ⅝-in. plywood decking.

Placing of reinforcing steel followed. This, too, was handled by the stiffleg. A total of 22 tons of steel went into the columns; 222 tons went into the bottom slab for a 1,046-yd pour.

Concrete supply was a 50-yph batch plant set up at the job site. Bulk cement, delivered by rail, was carried by screw conveyor to an 800-bbl silo and a 100-bbl

engine power BY CATERPILLAR

NEW

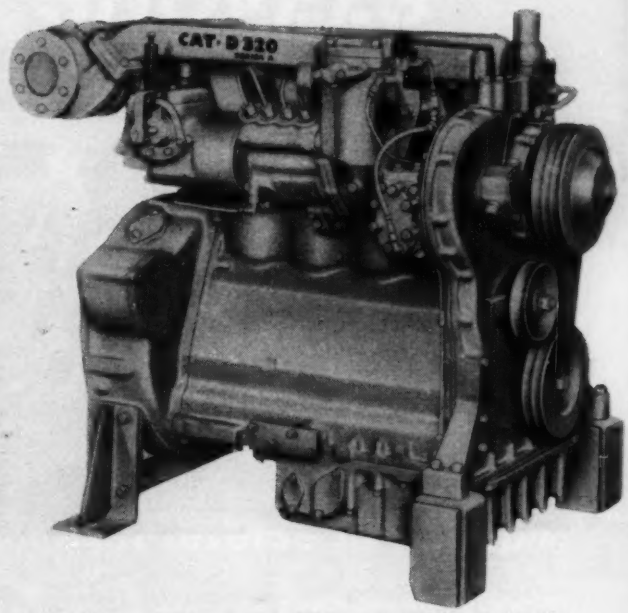
Caterpillar announces the D320—a high performance, lightweight, compact 120 HP Diesel Engine for ¾ yard excavators, small portable rock crushers, road rollers and 250 CFM rotary compressors. The D320 Electric Set is ideal for area lighting, standby and portable batching plants.

The Caterpillar D320 is a brand new four-cycle, four-cylinder, valve-in-head, precombustion chamber, turbocharged diesel. It is the most modern package of 120 HP you can find to power your equipment. As an electric set, it gives you 40 KW in a compact configuration.

The D320 weighs in at only 1,300 pounds, is just 44" long, less than 28" wide and just 36" high. With these compact dimensions, you can easily install the D320 on present equipment. It may make it possible for you to raise equipment profitability with increased HP—even though space is limited and weight must be held down.

And of course you get traditional Caterpillar Engine dependability, operating economy, maintenance ease and long life. This is a *heavy-duty* engine in every way.

Your Caterpillar Dealer has a lot more information on the D320. It's profitable information to have if you're considering repowering, ordering new equipment, or if you're planning to add a 40 KW portable electric set. Ask your Dealer's Engine Specialist for complete specifications. Also, write us for more detailed facts, and let us know the kind and size equipment you have in mind.



OTHER RATINGS

The ratings on this page are published as a general guide for world-wide use in a broad range of applications. Other ratings, yielding gains in performance and economic return, are available to meet the needs of particular applications when detailed information is submitted.

CATERPILLAR

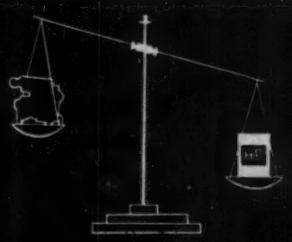
Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Less weight per HP—more engine in less space. Lightness and compactness minimize enclosure and undercarriage problems.

Ratings shown are for D320 with Turbocharger and Aftercooler, which is added for maximum engine output.

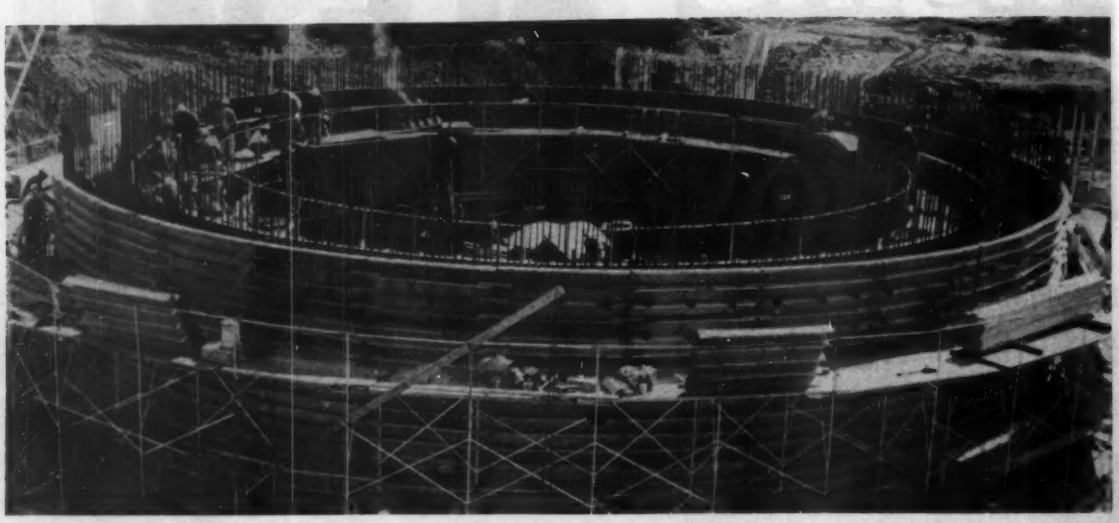
Every Cat Engine is built to rigid Caterpillar standards and carefully tested prior to delivery. Workmanship and power output capacity are certified.

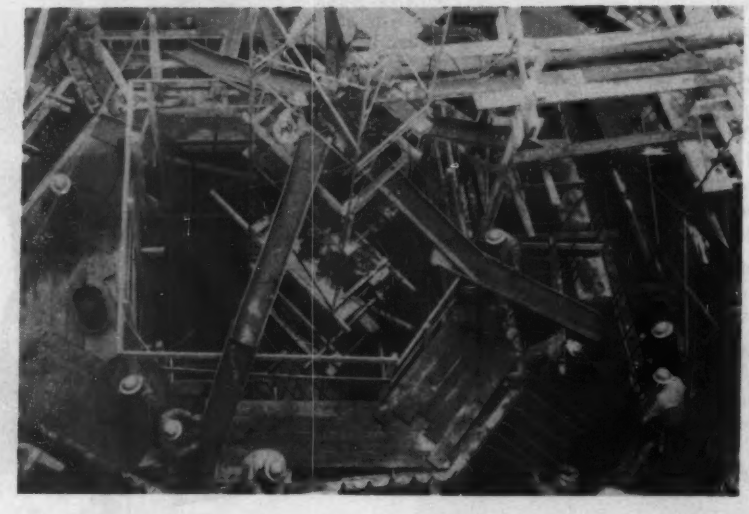


D320 HORSEPOWER RATINGS*

Maximum Output Capacity	120 HP	2400 RPM
Intermittent	95 HP	2400 RPM
Continuous	75 HP	2000 RPM

*WITHOUT FAN





RAISE WALLS—Raising scaffolding provides support for curved plywood wall forms and work platforms for crew. Forms are anchored with Richmond Ty-Scrus.

POUR CONCRETE—Concrete comes from Rex Pumpcrete machine on ground and discharges into small swivel chute which sends the mix down one of several fixed chutes.

storage bin. Aggregates were hauled in 40-mi by dump truck and rail cars. A 5-yd skip hoist batcher supplemented the plant ouput as insurance against delays during the massive pours.

Trucks Haul Mix

Transit-mix trucks carried the concrete from the batch plant to the site where the derrick handling two 1-yd upright buckets on a yoke frame, the two cranes, one with a 3-yd lay down bucket, the other with a 2½-yd lay down bucket, placed concrete.

From that point on, remaining forming and concreting became a series of staggered lifts alternating between the outside shield wall and the odd-shaped inner wall. The first 41 ft of outside shield wall is 5 ft thick. The top 36 ft of the outside shield is 2 ft thick.

As each lift rose, the tubular scaffolding was increased in height. Scaffolds were tied to job-fabricated plywood wall form panels and to each other with doubled 9-gage wire. The circular shapes of the forms along with the stagger system of pouring eliminated guying of forms or scaffolding.

At various stages on the scaffolds, the contractor placed scaffold planks to form work stations for labor forces. A doubled safety ladder—it resembled a latticed wood cage—provided safe access for workmen climbing to the heights.

Last concrete placed was for the final lifts of the interior walls. To reach these the contractor decided to go to Pumpcrete. A Rex 200 double Pumpcrete machine with a rated output of 50 to 65 yph was mounted on the ground. Steel pipe 7 in. in dia was run up the side of the structure and anchored to form ties protruding from the concrete. The pipe circled over the top of the structure and discharged into a small swivel chute that in turn discharged into one of several fixed chutes which brought the concrete to position.

*GIVES YOU EXTRA DUMP **HEIGHT** WITH A BONUS IN **REACH***
. . . LOADS BIGGEST TRUCKS EASILY

- **72 net engine hp**
- **21,000 lb**
- **1½ cu yd general purpose bucket**

With as much as a foot more dumping height than the maximum for ordinary tractor shovels, the 6G reaches 'way out at any height to dump over the center of big, side-boarded, 12-yd trucks . . . places each bucketful just where you want it. This height-and-reach combination pays off other ways, too—building stockpiles or loading out over the sides of excavations.

AND THAT'S ONLY THE BEGINNING . . .

HERE'S EVERYTHING YOU NEED FOR

BIG PRODUCTION.

NEW SLANT IN TRACTOR SHOVELS

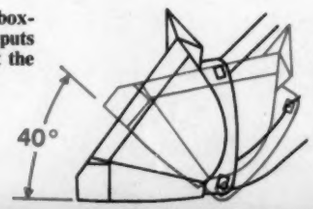
NEW BENEFITS for YOU

- 40° bucket tip-back
- Fast reverse to 4.1 mph
- Important operator advantages
- New "down-slope" visibility
- Best reach, best dump height in its class

BREAKOUT

action of the new 6G puts a 10¾-ton force at the cutting edge as the heavy-duty bucket tips back 40° on its curved bottom. This tremendous pry-out is far more effective than the fixed leverage of an ordinary, shoe-type bucket bottom. The 6G easily digs, lifts and loads stubborn boulders, stumps, pavement slabs or any hard-packed material with effortless speed—gets *more* digging-loading work done *faster* than any tractor shovel near this size.

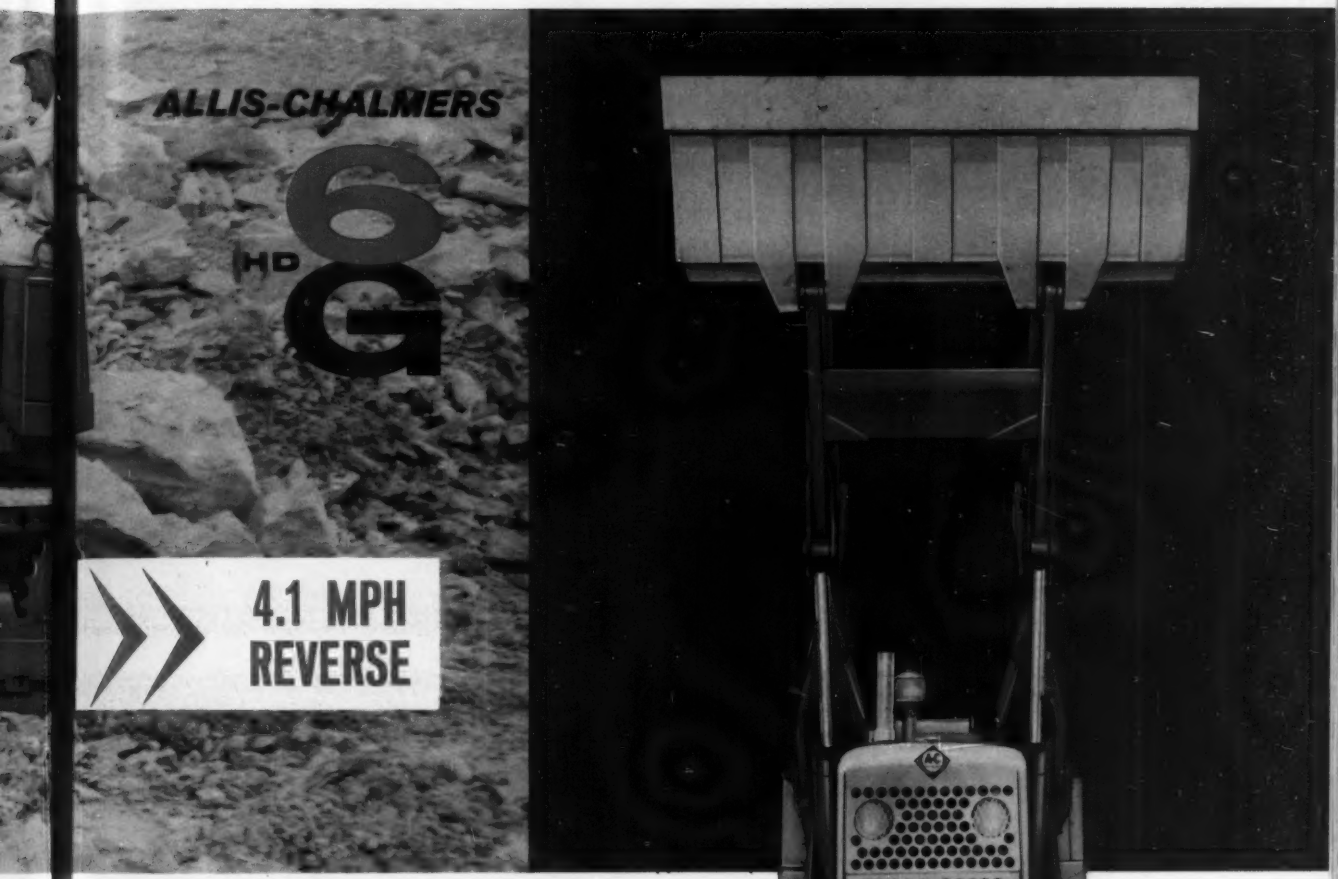
40° tip-back on curved, box-section bottom of bucket puts 21,500-lb breakout force at the cutting edge.



BALANCE

of the new 6G is outstanding, with nearly seven feet of track on the ground to distribute tractor and load weight for safe handling at big-production speeds. Engineered and built from track to stack as a tractor shovel—not just a tractor with a bucket—the 6G has stability and strength to lift heaviest loads safely and surely, right to the top without wobble or wasteful spilling. Dependable, heavy-duty hydraulics provide the precise control necessary to hold finish grades.

...AT LOW COST

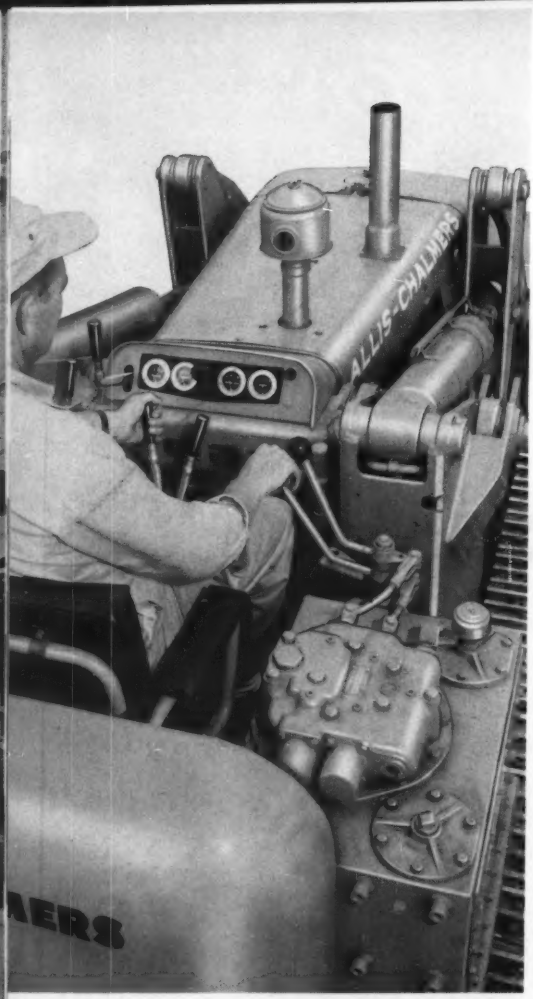


SPEED

. . . the new 6G can back away with a load at over 4 mph! You choose the *right speed* for every tractor shovel function—shift briskly from high reverse to any forward speed with a single lever. Bucket lift and return is perfectly controlled—a smooth, swift cycle that sets a fast pace on any job.

STRENGTH

. . . "In-Line" booms and linkage are twin towers of solid-steel strength in the new 6G. They're straddle-mounted on wide-spaced pivots in the shovel side frames for no-sway stability in all positions. Lift and dump cylinders operate in exactly the same line, put the 6G's hydraulic power to work "straight from the shoulder."



ALLIS-CHALMERS HD 6G

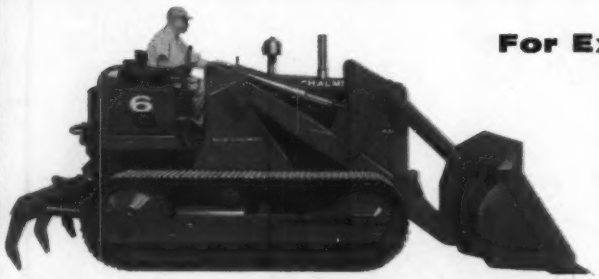
New Operating ease and service simplicity mean extra production . . . long life

Roomy Comfort. Deck-level entrance gangway . . . nine-position, foam-padded seat . . . easy-to-reach controls . . . plenty of leg room.

Clean-Sweep Visibility. Down-sloping, tapered cowl and hood . . . clear view of bucket . . . slim fuel tank, stub fenders for rearward vision.

"Extras" are Standard Equipment. Push-button starter on instrument panel . . . decelerator pedal . . . automatic bucket level indicator.

Certified Permanent Lubrication. Heavy-duty, tapered roller bearing truck wheels, idlers, support rollers never need greasing. *True* unit construction lets you remove and replace any major part without disturbing adjacent assemblies. *Both these features exclusive* in this size tractor shovel.



For Extra Return on Your Investment... Quick-Change Attachments

The 6G's 1½-yd general purpose bucket is ideal for most digging, handling and loading jobs. Add bucket teeth and rear-mounted hydraulic ripper and you've got a machine that's built for business at *both* ends in extra-tough work. Interchangeable front-end attachments mount in minutes, quickly adapt your tractor shovel to do special jobs faster and at lower cost.

Count on your Allis-Chalmers dealer for operating advice, maintenance suggestions and 'round-the-clock service—when and where you need it. He'll help you get top performance and long life from your 6G or any other Allis-Chalmers machine you own . . . with genuine, factory-quality, regular production parts—made for the machine, best for the job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

move ahead with

ALLIS-CHALMERS

...power for a growing world

Announcing WORLD'S TOUGHEST OFF-ROAD TIRE!

All-New Nylon U. S. Royal Super Con-Trak-Tor with ...69% to 95% Longer Tire Life!

S.R.T.*

Steel Reinforced Tread*

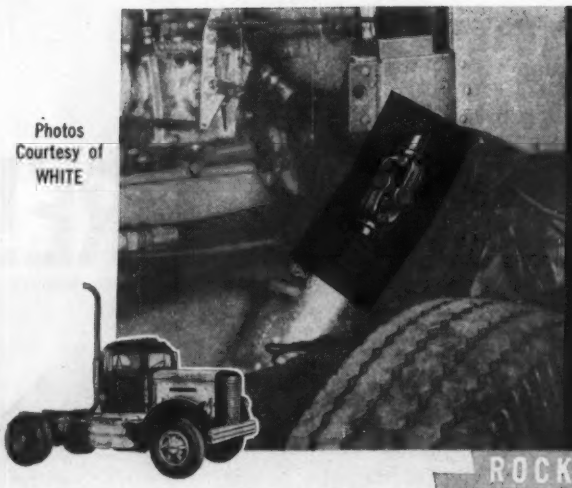
New S.R.T.—as shown here in the X-Ray photo—is a **tough** reinforcement of tread, shoulder and buttress areas. It consists of several thick layers of tread rubber containing thousands of short lengths of brass-coated steel filaments. This forms a virtually **impenetrable** mat between the tread and nylon cord body and extends down through the shoulder and buttress areas providing **positive** protection against combination cut-and-impact failures!

Add to exclusive Steel Reinforced Tread... 50% deeper tread at center... far deeper tread at shoulder... 25% more ground contact... Double-Strength Nylon and you have the world's **toughest** off-road tire! No wonder the great new U. S. Royal Super Con-Trak-Tor-S.R.T. outperformed **every** tire put against it—by the widest of margins—up to 95%! Can you afford less on **your** jobs?

U.S. ROYAL SAFETY 1st TRUCK TIRES

US RUBBER **United States Rubber**

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

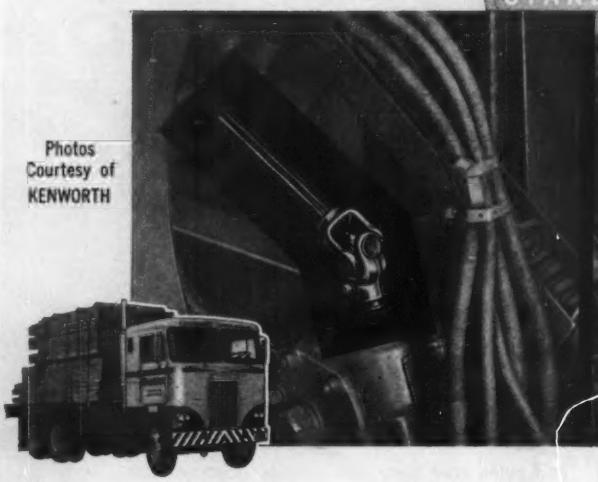


Photos Courtesy of WHITE

Photos Courtesy of GMC

ROCKWELL steering STANDARD

To "take power around corners" rely on the Keystone of Quality...



Photos Courtesy of KENWORTH

Photos Courtesy of REO

...select BLOOD BROTHERS Jointed Steering Shafts

On power steering assemblies for famous-make trucks, Blood Brothers Universal Joints "take power around corners" smoothly and dependably. They're widely used on manual steering assemblies too... for road-building and construction machines, farm tractors and self-propelled implements.

When you need universal joints to "take power around corners" — or provide for drive shaft flexibility — be sure to consult Rockwell-Standard. Our engineers will gladly assist you . . . and their experience may save money on your project.

K-1C

L6S, L6N

ROCKWELL-STANDARD CORPORATION

ROCKWELL R STANDARD BB UNIVERSAL JOINTS

Blood Brothers Universal Joints

ALLEGAN, MICHIGAN

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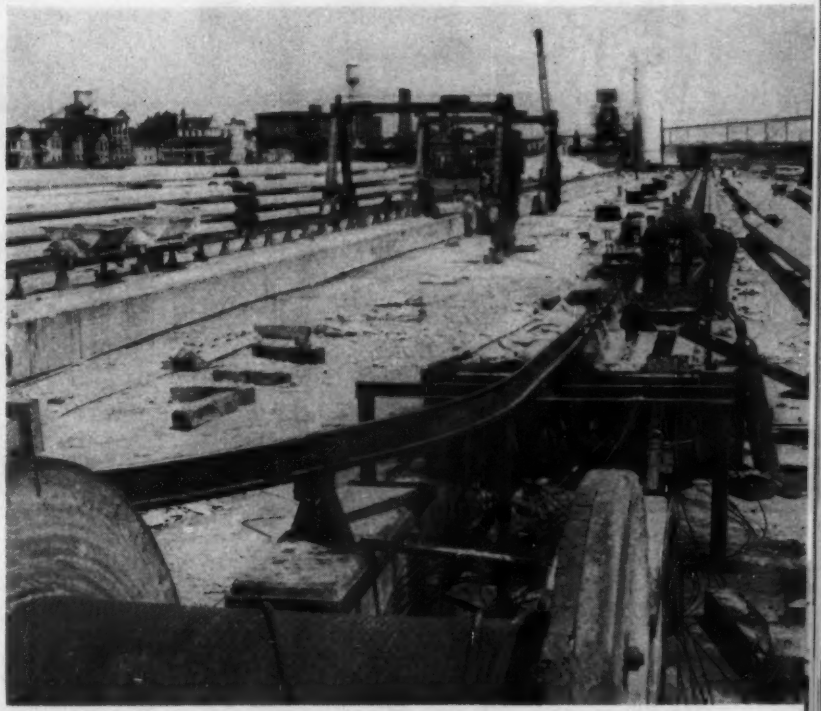
Concrete Rides Monorail In Prestress Plant



To keep up with a fast moving pile-driving operation and to make the best use of limited work area, a North Carolina contractor set up a compact and highly efficient prestressing plant. A big feature of the plant is the monorail system (right) that hauls concrete from batch plant to forms.

PILE DRIVING—Floating pile-driver (left) and skid-mounted rig (right) drive 30 concrete piles every day. Prestressing plant is in background, about ¼ mi away.

MONORAIL SYSTEMS aren't scoring many successes in the public transit field. But when it comes to hauling concrete, one monorail system in a South Carolina prestressed concrete plant is having all kinds of success.

The monorail system is the backbone of a high capacity, completely mechanized prestressing plant that Concrete Materials, Inc., of Charlotte, N.C., built for a dock construction job in Charleston, S. C.

One of the problems facing the designers of the plant was a shortage of space. The plant site was formerly a coastal swamp, and reclaiming land is expensive. The monorail was one of the ideas incorporated into the plant to get maximum efficiency in the smallest possible area.

The plant was built solely for the dock job. J. A. Jones Co. of Charlotte, N. C., has a $7.7-million prime contract with the South Carolina State Ports Authority to build the dock. Known as the Columbus Street Ship Terminal, the project involves 750,000 sq ft. of docks as well as several warehouses and other buildings.

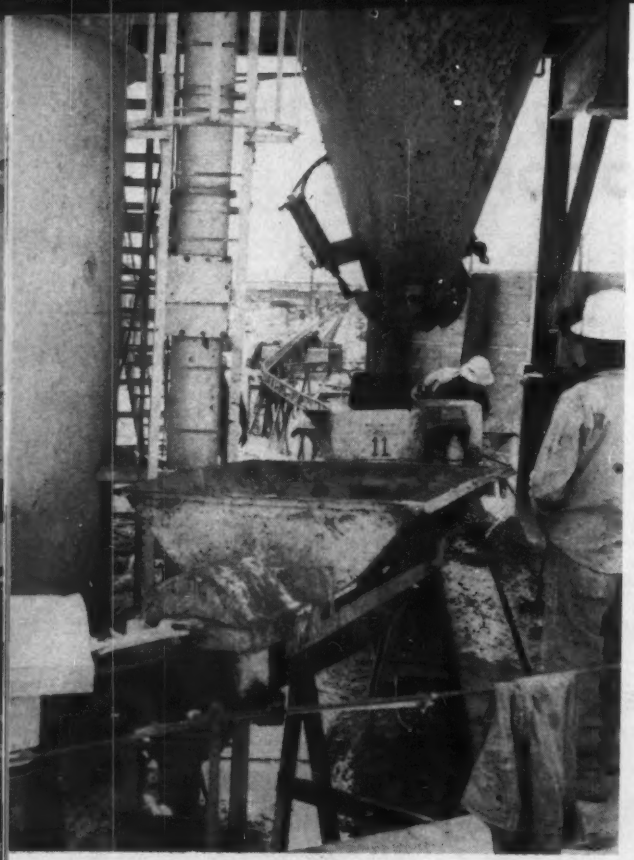
The foundations for the main dock consist of 21-in. octagonal prestressed concrete piles. On top of these will be concrete deck beams and a 10-in. concrete deck slab.

More than 5,000 piles will be needed for the project. They vary in length from 88 to 110 ft with the average being about 100 ft. The plant will produce 500,000 lin ft of piling before the job is finished in October, 1960. Operations at the plant started last fall.

To achieve this production, and to keep up with a pair of pile drivers that are driving 30 piles every day, the prestress plant operates 24 hours a day, 5 days a week.

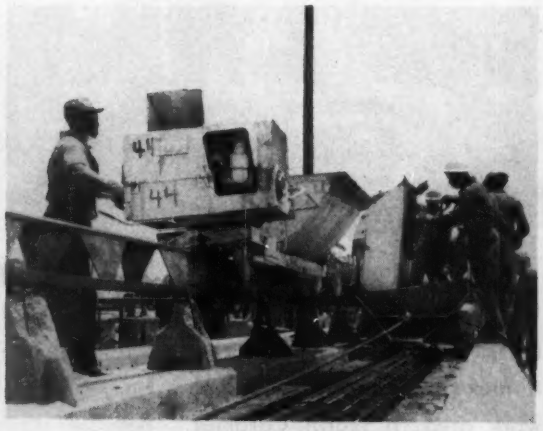
Monorail System

The monorail system consists of a single loop with 1,300 ft of track. The track passes through the



The Monorail System

LOADING CONCRETE—First stop on monorail route is batch plant where 10-cu ft hopper cars pick up their loads. Some cars are self-propelled, other work as trailers.



POURING CONCRETE — Monorail car dumps its load into hopper above pile form. Hopper is first of a three-unit train that feeds concrete into form and shapes pile.

batch plant at one end of the yard where the concrete cars pick up their batches. One side of the loop follows along one of the two casting beds in the yard. At the end of the bed it curves back and follows the second bed. Completing the oval, the track passes the cement silo and runs under the concrete discharge gates of the batch plant.

The train that carries the concrete along the monorail is a Rex Railporter, manufactured by the Chain Belt Co. It contains 10 hopper cars, each with a capacity of 10 cu ft of concrete.

There are two types of hopper car. One has its own 4½-hp motor attached. The other is similar, but it has no motor and works as a trailer behind one of the powered units. Operating the powered units is simple; one clutch lever controls forward and reverse motion. The two drive wheels ride on top of the monorail. Horizontal wheels ride along the bottom of the rail to stabilize the car.

It takes 800 hoppers of concrete each day to cast 30 piles. This means that each car will travel 5,000 mi during the job.

Concrete Materials, Inc., built the track for the concrete train. The monorail is a 3-in. channel weighing 4.1 lb per ft. Under the channel are inverted trapezoidal support pieces made of ¼-in. steel plate. The plates are 12 in. wide at the top where they connect to the channel and 6 in. wide at the bottom. They rest on a 1⅛-in. steel bar that is supported at 5-ft intervals on small concrete piers. The piers are set on one of the concrete walls of the casting bed so that the cars can dump directly into the forms.

Concrete Plant

The concrete plant is located at one end of the prestressing beds. It is a Noble automatic batch plant that turns out 3,000 cu yd of concrete per day. The plant has two T. L. Smith turbine mixers. Hopper capacity is 100 tons.

In addition to the concrete for the piles, the batch plant produces 800 cu yd of concrete a week for the poured-in-place deck slab that Jones is building.

Working around the clock, the plant consumes 400 bbl of cement, 300 tons of aggregate, and 150 tons of sand each day. Storing this quantity of material is a problem because of the limited space.

Concrete Materials, Inc., wanted enough storage capacity so the plant would not run short of material. At the same time they did not want to reclaim any more of the swamp land than they had to. They settled on an aggregate stockpile of 800 tons, almost a three-day supply.

The aggregate comes in bulk rail cars from the Material Sales Co. in Gravelton, N. C. A Bucyrus-Erie 38-B crane with a 1½-yd clamshell bucket unloads it at the site.

Sand comes by truck from the Colleton Sand Co. in Summerville, S.C. At the plant, the trucks dump it in piles on the ground. Then the Bucyrus-Erie clamshell transfers it to a storage bin.

The cement, type I portland, comes to the site in bulk rail cars from the Carolina Giant Cement Division in Harleyville, S. C. It is unloaded into an under-track hopper, then elevated to a 800-bbl silo.

Concrete is designed for 9,000-psi strength at 28 days. The only

SHAPING THE PILE—Long screeds attached to back of moving hopper shape the sloping top sides of the octagonal pile. This system replaces original fixed top forms.

additive that goes into it is ¼ lb of Pozzolith per sack of cement.

A job-made system feeds the Pozzolith into the batching system automatically. When the water-batch circuit is activated, the Pozzolith feeds into plastic measuring bottles. Then, when the cement-dump circuit is activated, the bottles dump the admixture into the batch.

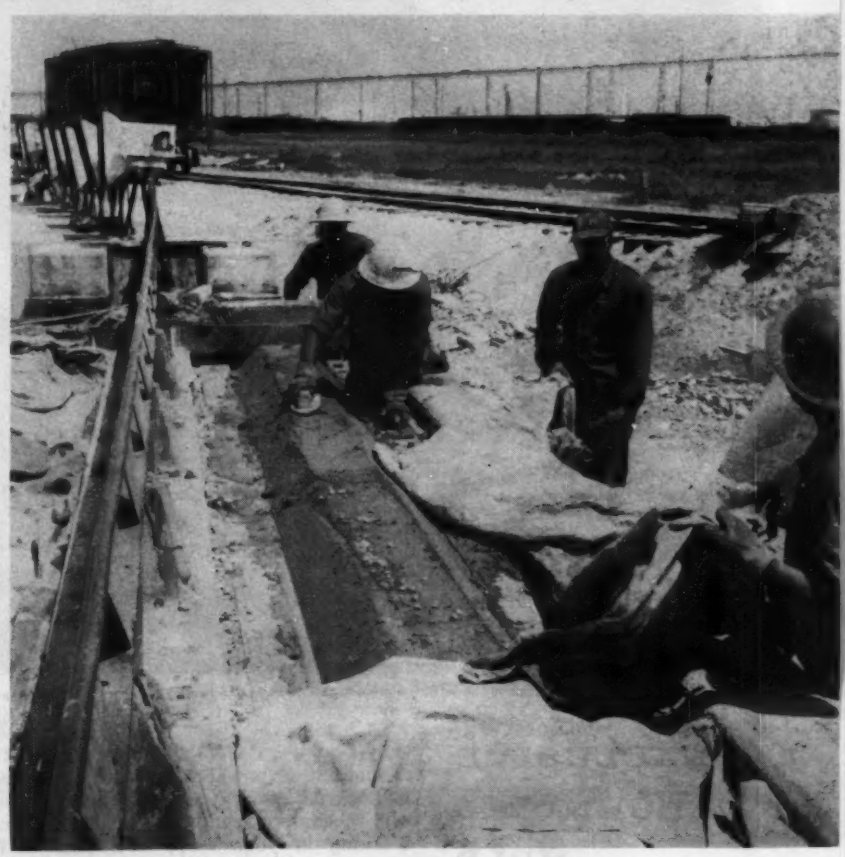
Casting the Piles

Two casting beds alternate to form the piles. Each bed is 500 ft long and 11 ft wide. Concrete sidewalls are 30 in. high and 12 in. wide.

The bottom five sides of the pile are formed in steel forms fabricated by Form-Crete of Lakeland, Fla. There are four of these forms in operation.

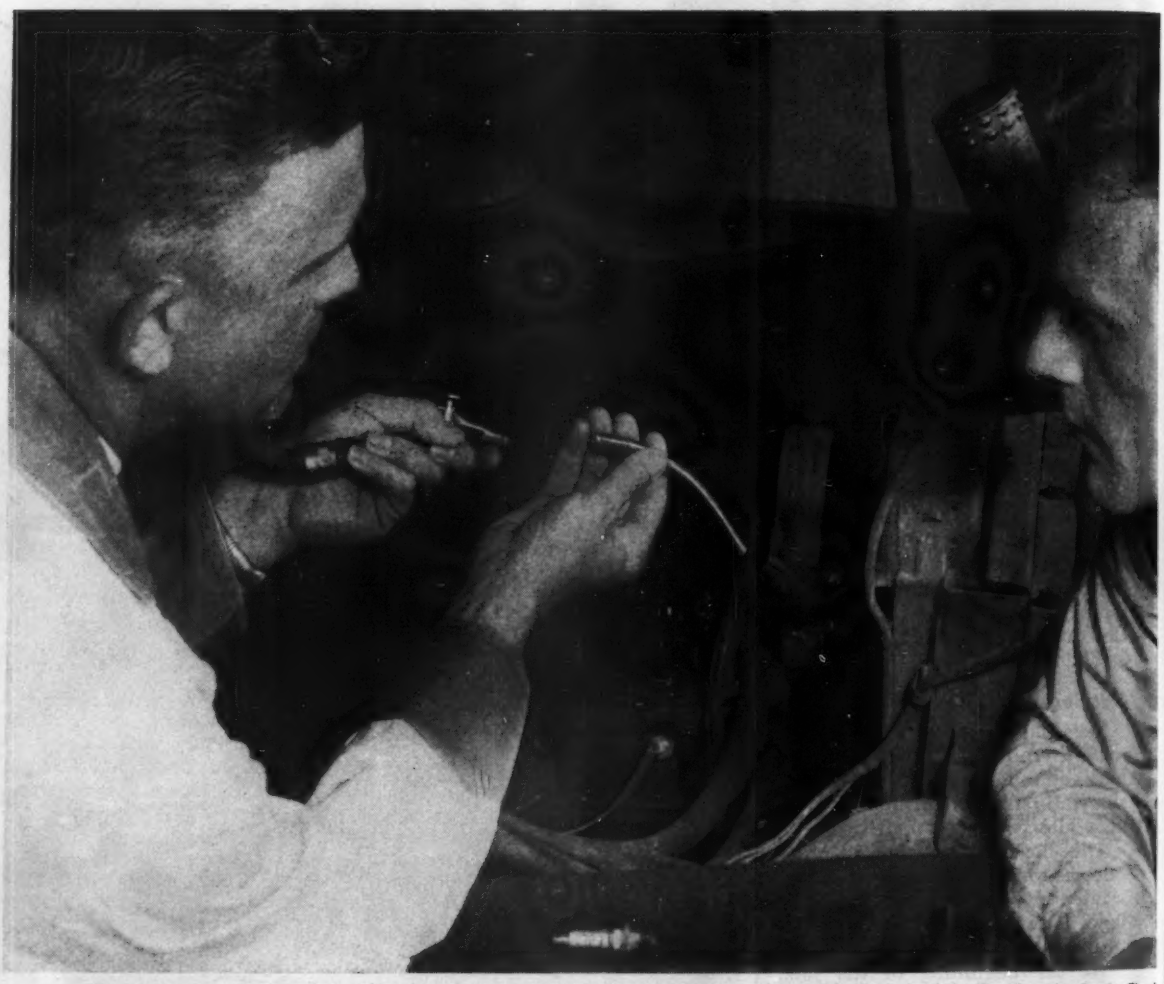
At the beginning of the job, Concrete Materials, Inc., used individual top forms for the piles. But now they have perfected a system of traveling forms that move along the pile, shaping it as they go. The pouring train, which includes the moving forms, consists of three sections.

continued on page 136



FINAL SHAPING—Workman with hand trowel shapes the top side of the pile. Other men start to cover pile with neoprene-impregnated tarps in preparation for steam curing.

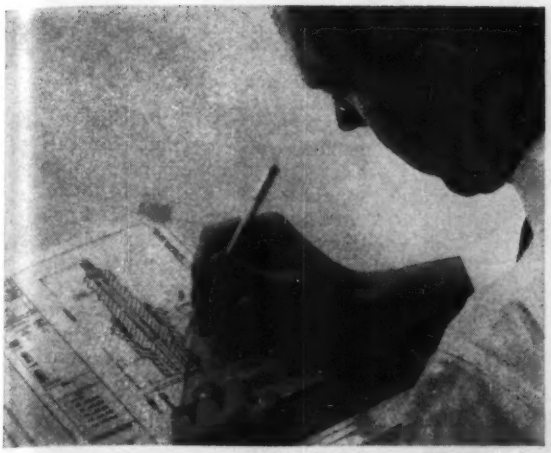
Here's how Champion "know how" can help your fleet improve ignition performance and cut shop costs



Champion representative shows fleet mechanic how to recover a terminal nut accidentally dropped into an open spark plug hole. (See Champion Service Tips.)

EXCLUSIVE TECHNICAL HELP

Only Champion offers your fleet this specialized technical help. At your request, a Champion representative will schedule a call at your fleet. Working in your shop, he'll pass along to your mechanics the latest ignition "know how" from Champion, the world's largest manufacturer of spark plugs. Use this free service to improve ignition performance and cut maintenance costs in *your* fleet. Write to Technical Services Dept., Champion Spark Plug Company, Toledo 1, Ohio.



SPECIFIC ENGINE DESIGN

Champion engineers design spark plugs for every make of commercial vehicle, and every kind of service condition. That's why there's a Champion spark plug that will deliver full power and top gas economy for every engine in your fleet.

MAXIMUM LIFE

Champion's Powerfire electrode outlasts ordinary electrodes under heavy hauling conditions that push combustion chamber temperatures up into the critical ranges. That's why you get better performance *longer* with Champion spark plugs.

SPECIAL APPLICATION PLUGS

If you have a fouling problem caused by constant idling or continual stop-and-go driving conditions, *auxiliary-gap* Champions can help solve it. Auxiliary-gap Champions resist fouling far longer than ordinary plugs, cut costs because they require fewer cleanings.

18 OF 21 TRUCK MANUFACTURERS INSTALL

CHAMPION

SPARK PLUGS

CHAMPION *Service Tips*

FOR BETTER ENGINE PERFORMANCE

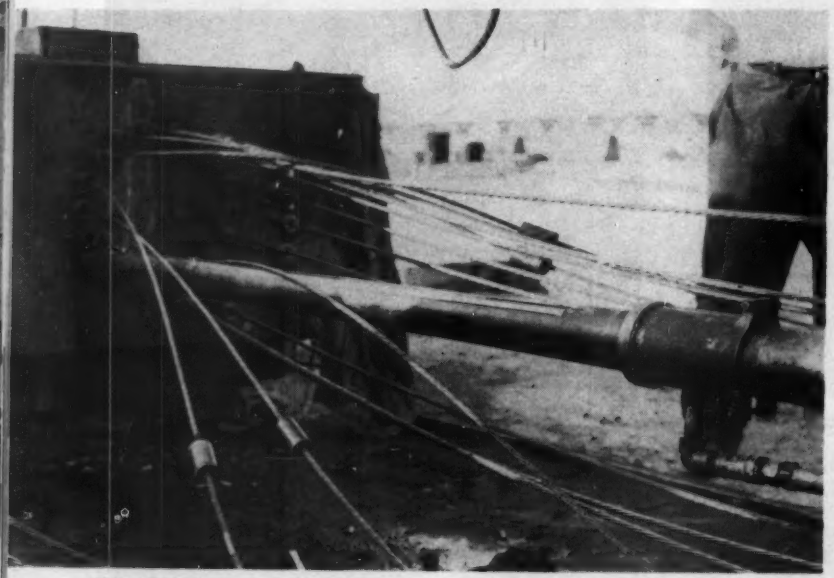
Don't "honeycomb" your pistons!

This piston damage was caused by a terminal nut accidentally dropped into a spark plug port.

If you accidentally drop anything into a combustion chamber, here's a tip on how to get it out: Ground the coil so the engine won't start . . . "bump" the starter until the piston in this cylinder reaches T.D.C. and both valves are closed. Then, take a small piece of copper tubing, bend it to form a slight hook, and attach it to your air chuck. Build up full pressure on your compressor, insert the tubing into the spark plug hole, and blast away in every direction. This procedure will usually blow any small object right out the plug hole.

If plug ports are under the exhaust manifold, follow the same procedure but hold a large mirror at an angle so you can see the hole, with plenty of light available. Chances are you will be able to see either the object or its reflection as it passes by the mirror.

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO



TENSIONING—Prestress wires in pile are tensioned one at a time in a carefully prescribed pattern. Pipe sleeve around wire protects the men if wire should break.

REMOVING THE PILE—Two 10-ton Travelifts, working together, break pile loose from form and deposit it alongside casting bed. Pile then will be taken to curing yard.

First unit is a guide-hopper. The monorail cars pour concrete directly into this hopper, which funnels it into the bottom forms. Two Chicago Pneumatic Hi-Cycle internal vibrators with 2⅜-in. heads vibrate the concrete at this stage.

Power source for the vibrators is a McGinnis, 180-cycle, 3-phase generator. This generator is designed for five gangs of vibrators. Hooked to just two, it supplies enough power to turn them at 10,000 rpm.

The contractor is experimenting with, and hopes to be using soon, vibrators permanently mounted on the steel pouring train. This will free the men who now handle the vibrators. Also it will insure a constant amount of vibration throughout the concrete.

The second unit in the pouring train is a moulding hopper that roughly shapes the top part of the pile. Third unit is a screed that shapes the top two sloping sides of the octagonal pile The top side of the pile is hand troweled to shape.

A Tulsa winch, powered by a 7-hp motor, pulls the pouring train along the beds.

The piles pass through two curing processes. Immediately after the train moves over the bed, workmen cover the pile with neoprene - impregnated tarps and steam curing begins.

Steam at 50 psi is piped to the beds through concealed piping from a 150-hp Titus horizontal Scotch marine fire-tube boiler, heated by a Tulsa gas burner. Steam curing lasts about 12 hr until the concrete tests at more than 4,000-psi strength. Then the piles are removed from the forms.

Two 12-ton Travelifts, working together, break the piles from the forms and position them beside the beds. A workman following the Travelifts breaks off the bulkhead forms.

These bulkheads are two-piece affairs consisting of an outer ring and an inner plate. They are specially built of aluminum by H&M Foundry of Savannah, Ga., at a cost of $35 each. They can be reused about 20 times.

The second stage of curing takes place in a special curing yard. A pair of Ross Straddle-Carriers

top banana!

Men who buy valve face grinding machines have made SIOUX the top banana. More SIOUX VFGM's are in use today than all others combined!

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SIOUX

ALBERTSON & CO., INC.
SIOUX CITY, IOWA, U. S. A.

Curtain walls of precast concrete achieve dramatic interplay of light, color and texture

The unbroken whiteness of the end wall is in striking contrast to bright, blue-green spandrel panels of the sidewalls. And on the broad base wall below, light and shadow form bold patterns across the sculptured facing. 42 stories, and the tallest office building in the West, the Southland Life Tower is part of a $35,000,000 project in downtown Dallas, Texas.

It's all done with concrete panels. For the end walls and base, exposed quartz aggregate and white portland cement give surface roughness and brilliance. The smooth-faced spandrels are ceramic tile cast in concrete. The total effect is one more example of the unlimited design possibilities in today's new forms of concrete.

Architects and Engineers: Welton Becket, FAIA, and Associates, Los Angeles and Dallas. Consulting Architect: Mark Lemmon, AIA, Dallas, Texas. Structural Engineers: Murray Erick Associates, Los Angeles.

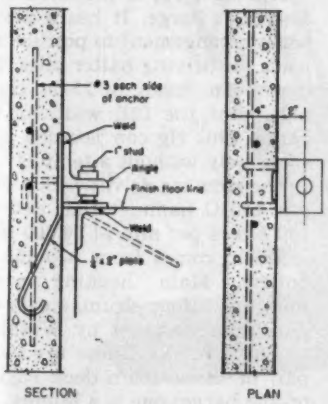
FOR STRUCTURES... MODERN **concrete**

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

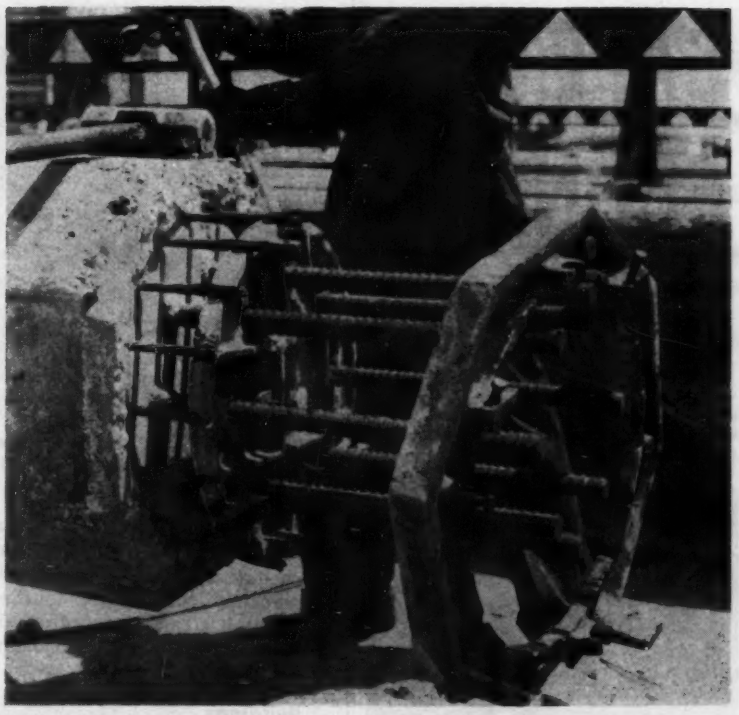
Curtain walls go up fast with easy-to-hang concrete panels

At the Southland Center (both the Southland Life Tower and the Sheraton-Dallas Hotel) panels were lifted from trucks, fastened to frame and the joints were sealed as construction progressed. Erection of concrete panels is fast and easy, saves money and construction time. Today, in similar construction everywhere, the use of lightweight concrete gives added ease of handling, over-all weight reduction. And because wall units often need no back-up, reduced cross-sections are achieved with concrete panels.



Fastening simplicity. The drawing above shows one method of connection. The use of studs gives room for adjustment, so panels can be accurately aligned in case of slight irregularities in the building frame.

Portland Cement Association



REMOVING BULKHEAD—Workman pries loose the bulkhead that separates piles in the casting bed. Bulkhead is made of aluminum, consists of inner plate and outer ring.

picks up a pile and carries it to the curing yard where it remains for 14 days.

The curing yard covers much of the 10-acre plant site. With piles being driven at the rate of 30 per day, the curing yard has to have a capacity of at least 420 piles.

As they leave the casting area, piles are stenciled with a code such as 4-7-16-101. This means that the pile is one of four such lengths cast on July 16 and it is 101 ft long.

Pile Reinforcing

While a concreting crew is pouring one casting bed, a tensioning crew is busy wiring the other. Each pile contains eighteen 7/16-in. strands. These strands are pulled into place simultaneously by the same drum winch that pulls the pouring train.

Lateral reinforcing is ♯5 galvanized steel wire. Starting at one end of the pile, the wire spirals for five turns at a 1-in. pitch, then four turns at a 3-in. pitch. The remainder of the pile has a 9-in. pitch.

The jacking system puts 18,900 lb tension in each strand. There is no end abutment on the beds. The beds are made of post-tensioned concrete and carry the tensioning and detensioning forces themselves.

Hydraulic power for the jacking comes from a Rogers Co. system that has been considerably modified on the job. The contractor added a 10 gpm, 1,000-psi pump with automatic directional cutoff valves that allow a considerably slower pull-stroke when cable pressure is above 1,000 lb. A 15-ton Elgood hydraulic jack does the actual jacking.

A 10-ft length of double pipe encloses each strand at the jacking end. The outer pipe is 3 in. in dia; the inner pipe is 2 in. in dia. The pipe contains the strand and prevents injury to workers should the wire break.

The protective sleeve is positioned with a conventional heavy-duty automobile jack that has been modified by placing the elevating lever on top rather than on the side.

After the cable stress builds up

SPEED
SAFETY
ECONOMY

With Richmond Hanger Frame-Ty Systems for Slab Form Support

The effectiveness of slab form support is measured in three terms: speed, safety and economy. Richmond Hanger Frame-Tys are ideally suited for this type of construction. One popular unit is the "Free-Fit" type.

Only Richmond Free-Fit Hanger Frame-Tys Give You—

1. Continuous heavier wire construction.
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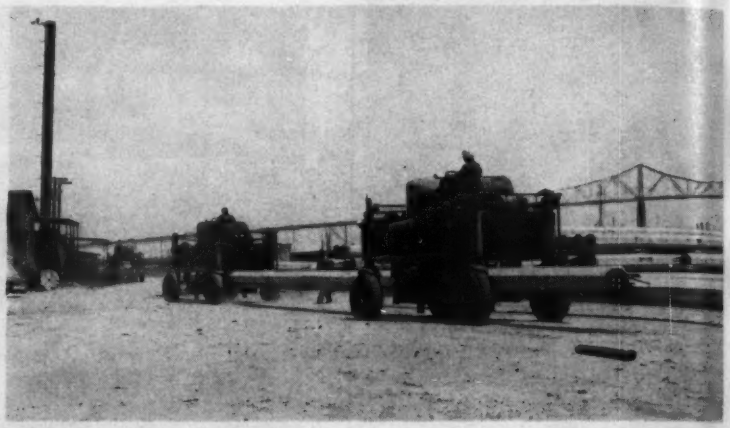


DELIVERING THE PILES—Two Ross Straddle-Carriers, working together, carry a pile from curing yard to within reach of pile-driving rigs. Round trip takes about 20 min.

to 18,900 lb, Supreme Strand chucks hold the strands during the steam curing period. Then workmen take off the tension by burning strands at both ends of the pile in a prescribed balanced pattern.

Buildings

There are five buildings on the plant site. One is an inspection office in which the South Carolina Ports Authority inspector tests cylinders taken from every cast. The cylinders average 4,000 psi after 10 hr; 6,000 psi after 7 days, 7,500 psi after 14 days; and 9,000 psi after 28 days.

A second building serves as a dressing room for the men. On each of the three daily shifts there are 16 men working on the production crew, four men on material handling, and three men in the batch plant. Ten maintenance men handle the three shifts. Four office workers are on the daytime shift.

The third building houses a tool shop on one side and a porch area on the back that is used for winding the lateral reinforcing wire and welding dowel cages.

The fourth building houses the steam generating unit. The fifth structure supplies office space for the contractor.

Pile Driving

The pile driving operation is about a quarter of a mile from the pile storage yard. Concrete Materials, Inc., built a soil cement road to connect the areas. Four Ross Straddle-Carriers, working in pairs, move the piles from the storage yard to the driving area.

They try to keep at least two piles ahead of each pile driver. The Straddle-Carriers take about 20 min to pick up a pile in the curing yard, haul it to the dock area, and drop it near a driving rig.

Ben C. Gerwick, Inc., of San Francisco has a subcontract to drive the piles. They have two rigs on the job, a scow-mounted machine and a skid rig.

The scow rig is mounted on a 38x110-ft barge. It has a moonbeam arrangement to position the leads for driving batter piles. The moonbeam, made of 15-in. channels, runs the full width of the barge. This rig can position piles accurately without a templet.

The scow rig drives with a Vulcan 140-C hammer that delivers 100 blows per min at 36,000 ft-lb.

Steam comes from two 150-hp boilers. Main hoisting power source is a four-drum, steam engine manufactured by Washington Iron Works. There are also a pair of three-drum deck engines on the barge; one is a Mundy, the other a Clyde. A three-drum American engine positions the leads for batter driving.

The V-shaped skid rig has 100-ft leads. It operates on a skid base 65 ft long, 25 ft wide at the rear, and 4 ft wide at the front. The skid rig can drive only vertically, but it spots piles accurately without a templet.

continued on page 142

NEW FROM LORAIN

40-TON LORAIN-56

Now Lorain offers you a 40-ton crane in the 1¼-yard class . . . with 14′-long, 13′-wide crawlers . . . handles booms up to 110′. Its greater capacity and exclusive design features will increase your output . . . let you handle bigger jobs…boost your profits. Check these advantages:

"Shear-Ball" connection.★ Like a huge ball bearing, Lorain "Shear-Ball" connects the turntable to the crawler and provides a smooth, rock-steady swing. It eliminates the adjustment, maintenance and lubrication problems of rollers and center pin designs.

35-foot Square-Tubular-Chord boom. Sealed, square-tubular-chords of high alloy steel, and sealed, round-tubular lacings make a lighter weight, stronger boom. A Lorain exclusive, this boom can reach farther, pick up greater loads.

"Joy-Stick" air power controls. Using just two levers, the operator controls single or combined operations, retains normal feel of the machine. "Joy-Stick" action applies metered air power to all turntable clutches for the smoothest, most responsive control yet devised.

This new 40-ton Lorain is convertible to dragline, clamshell, crane or hoe to fit your needs. See your nearby Lorain distributor for details.

★10 YEAR WARRANTY ON "SHEAR-BALL" CONNECTION

The "Shear-Ball" connection has proven so reliable in ten years of field use on many hundreds of machines that Lorain now backs it with a written warranty. "Shear-Ball" connections are warranted not to fail to function under normal use and service within 10 years of delivery to user . . . warranted to be free from defects in materials and workmanship. See your Lorain distributor.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN®

ON THE MOVE

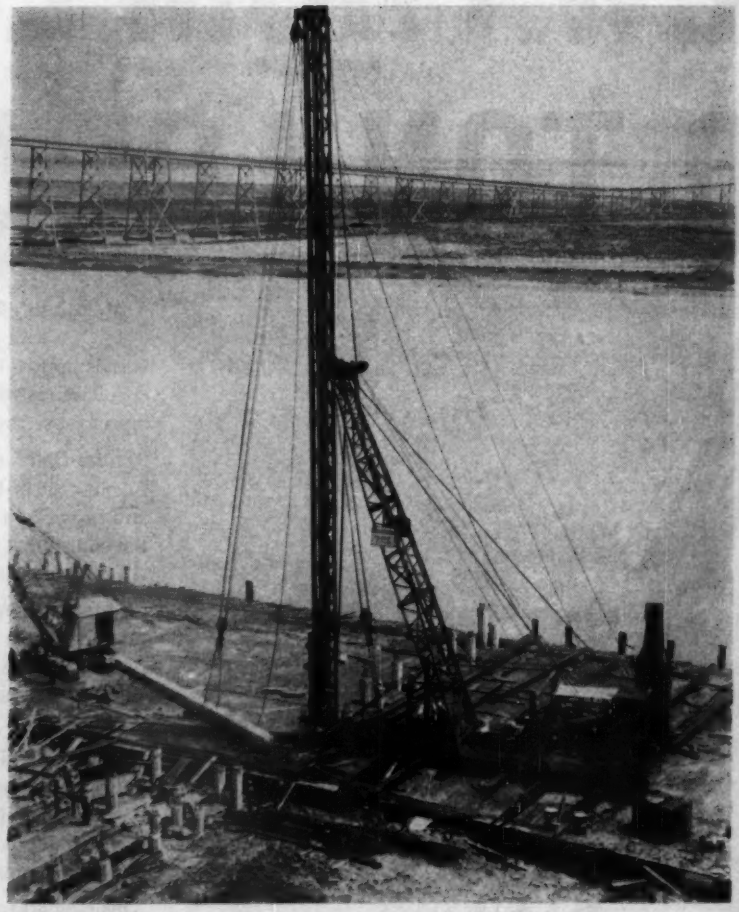
PLANTS in Lorain, Elyria and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity · Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes · Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

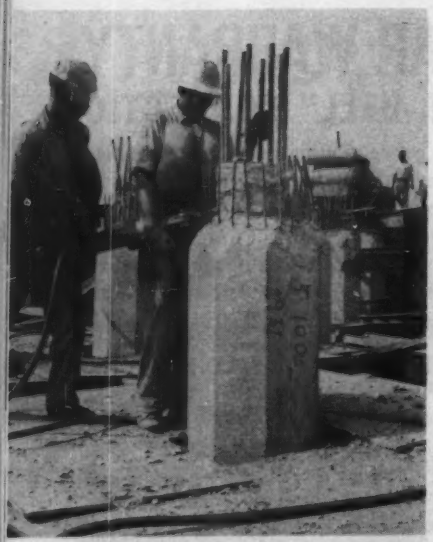
OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

Two Pile Drivers Put in Place 30 Piles a Day

FLOATING PILE DRIVER—Steam-powered pile driver mounted on a 38x110-ft barge drives piles beside old dock. Moonbeam enables rig to position batter piles.



SKID-MOUNTED PILE DRIVER—Skid rig handles land-side piles. Manitowoc 2000 crane helps big rig pick up piles. With fixed leads, skid rig drives only vertical piles.



CUTTING PILE TOPS—After pile has been driven, man with torch cuts off tops to proper elevation. Afterwards, pile caps and the concrete deck will be constructed.

The rig mounts a single-acting, McKiernan-Terry S-10 hammer that develops 32,500 ft-lb and delivers 55 blows per min. Power source is a 150-hp boiler. Engine is a three-drum Lidgerwood.

Because of its fixed leads, the skid rigs needs help to lift the piles. A rented Manitowoc 2000 handles one end of the pile when the skid rig is ready for a new pile. Nine men make up the skid rig crew. Another two men handle the Manitowoc.

Driving has been relatively easy. At some points, the 100-ft piles drop as much as 65 ft under the deadweight of the pile and hammer.

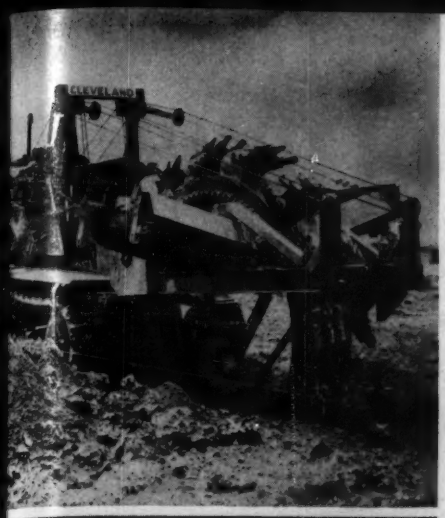
The skid rig has driven the piles on the land side of the dock. Now it is working in the middle of the new dock area. It moves forward over newly driven piles because the old dock, supported on wooden piles, is not strong enough to carry the weight of the rig.

Dock beams vary from 2½ to 4 ft in depth. Pile caps are poured-in-place concrete, 3 ft wide and 2½ ft deep. Buildings on the dock, to be constructed by Jones, will include a 228,000 sq ft warehouse, a 152,000 sq ft warehouse, a banana shed, and three maintenance buildings.

The warehouses have tilt-up panel walls. The panels weigh 22 tons each and are poured in place. A Bucyrus-Erie 22-B tilts them up into place.

For J. A. Jones, Sam Aaron is superintendent, and George Marett is assistant superintendent. John Ford is superintendent for Ben C. Gerwick, Inc. George A. Cooney is superintendent for Concrete Materials, Inc.

The pre stress plant was designed by C. C. Zollman Associates of Newton Square, Pa.



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Advantages ACCURACY PRODUCTION ECONOMY

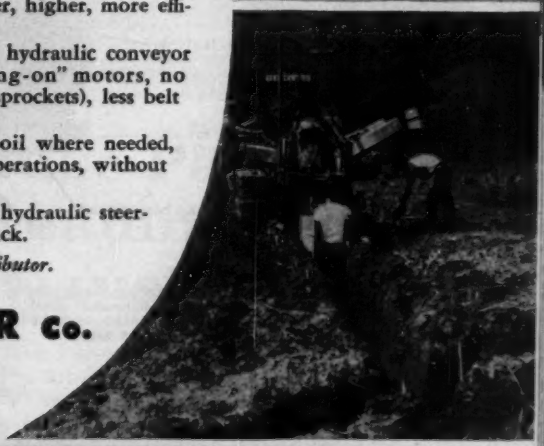
FIT MORE JOBS EVERYWHERE

CLEVELAND J TRENCHERS have exclusive new features and operating advantages which make them the most usable machines ever built for digging trenches. They fit more jobs. They dig economically and profitably under job conditions which heretofore blocked out the practical use of a trenching machine. Everywhere, under *all* job conditions, they dig cleaner more accurate trench—dig it better, faster and cheaper.

These new J trenchers have all the famous features previously pioneered by Cleveland *plus these revolutionary new advantages:*

- *Every* operation is automatic, completely controlled at operator's seat.
- V conveyor—for faster, higher, more efficient spoil discharge.
- Dual, pulley-enclosed, hydraulic conveyor transmissions (no "hung-on" motors, no conveyor chains and sprockets), less belt slippage, fingertip control of belt direction and speeds.
- Automatic conveyor positioning—operator places spoil where needed, digs past poles, trees, etc., without interrupting other operations, without ever leaving his seat.
- World's finest trencher crawler, 1,000-hour-lubricated, big 16" x 3" hydraulic steering brakes, a tremendously long lived, trouble free, easy rolling truck.

Get all the facts now on these new Clevelands from your distributor.



The CLEVELAND TRENCHER Co.

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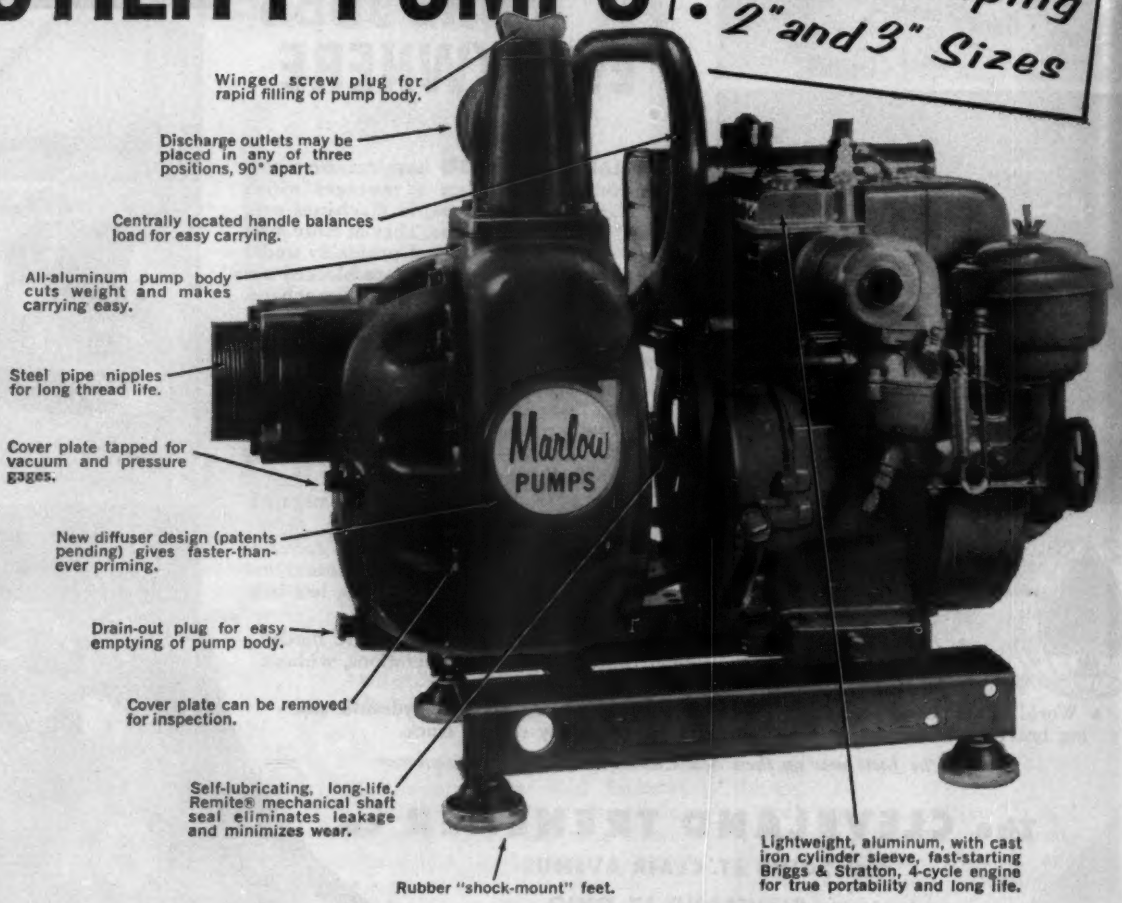
TWO NEW MARLOW LIGHTWEIGHT UTILITY PUMPS

- Faster Priming
- Better Pumping
- 2" and 3" Sizes


Winged screw plug for rapid filling of pump body.
Discharge outlets may be placed in any of three positions, 90° apart.
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All-aluminum pump body cuts weight and makes carrying easy.
Steel pipe nipples for long thread life.
Cover plate tapped for vacuum and pressure gages.
New diffuser design (patents pending) gives faster-than-ever priming.
Drain-out plug for easy emptying of pump body.
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Lightweight, aluminum, with cast iron cylinder sleeve, fast-starting Briggs & Stratton, 4-cycle engine for true portability and long life.
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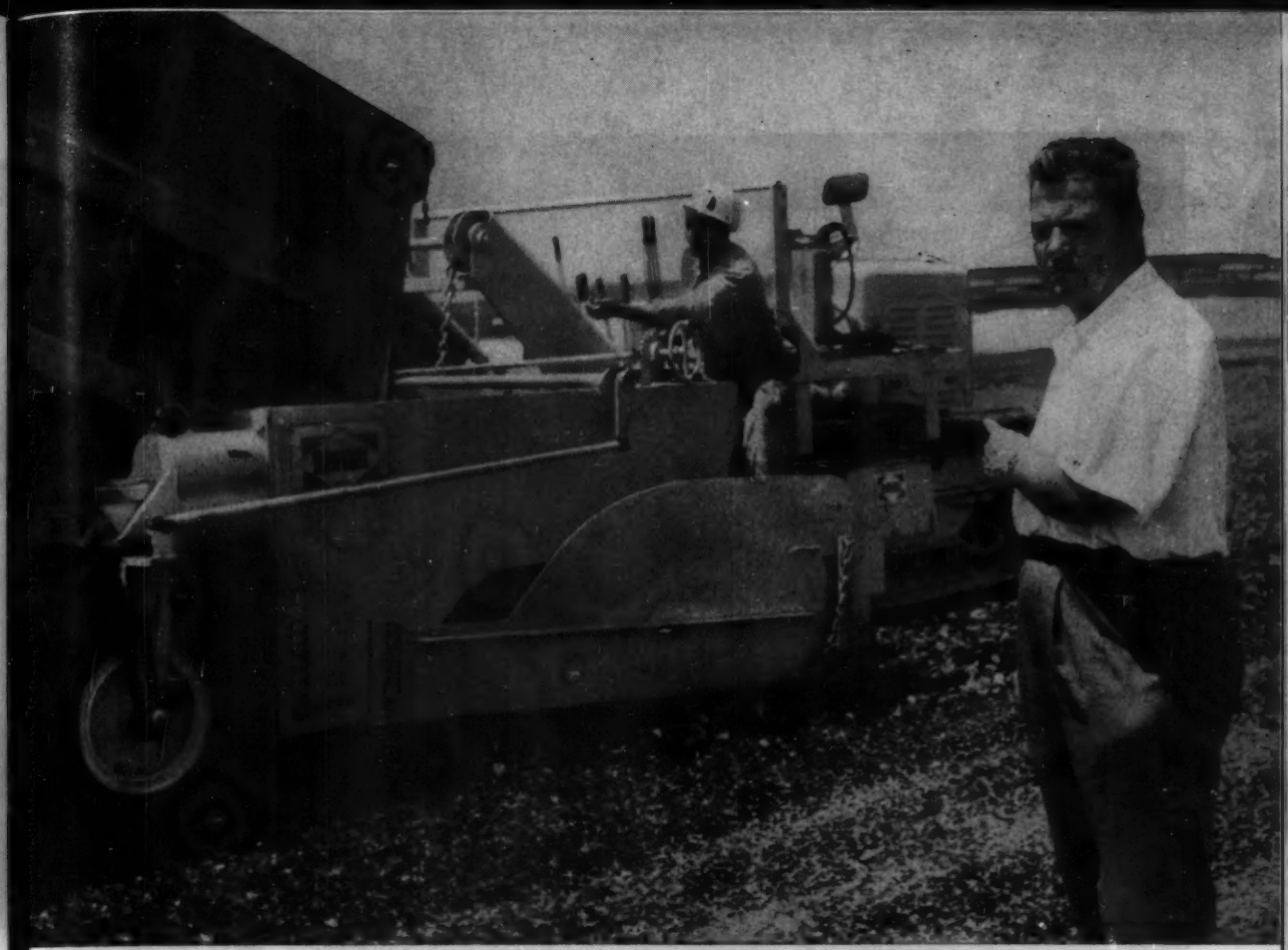

Base for the 75-foot wide taxiways was constructed with a ¼-inch crown in the center pass, and a one inch grade in each side pass.

"With the Blaw-Knox Base Paver we cut costs 50% in spreading stone for 8 miles of Jet Taxiways"

"We estimate that the P-150 will have completely paid for itself in operational savings by the time it has spread 100,000 tons . . . and it will make a real contribution to a firm like ours whose contracts are received on the basis of work quality, equipment, speed, and low bids . . ." reports Mike Adams, Vice President and Project Manager for Orlando & Edenwald Contracting Company, Whitestone, New York.

"Formerly, we used the truck and chain method, followed by a roller. Trucks would often dump irregularly, and the roller would have to cross and re-cross to get some degree of surface regularity. With the Blaw-Knox Base Paver, the entire operation has been improved. The automatic features of the P-150 permit a greater degree of control over surfaces, and consequently grades, than was ever practical before. This is a big factor in meeting the more rigid specifications set for jet taxiways," he adds.

Improved automatic production that pays for the cost of the machine is typical of Blaw-Knox Paving Equipment. Your Blaw-Knox Distributor can give you the full story. See him for ways to improve your production and profit picture.

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BLAW-KNOX COMPANY

Construction Equipment • 300 Sixth Avenue • Pittsburgh 22, Pennsylvania

Glen Canyon Dam will be built for the U.S. Bureau of Reclamation. *Prime contractor:* Merritt-Chapman & Scott Corp.

They bolted the face of this 700-ft cliff

This sheer canyon wall will soon form one side of Glen Canyon Dam which will arch 1500 feet across the Colorado River in Arizona. The dam when completed will store water to generate electric power for a five-state area. Here you see construction workers, hundreds of feet above the river, drilling holes in the rock face of the cliff with Bethlehem hollow drill steel.

After the holes are drilled, Bethlehem slotted rock bolts are installed. When the bolts are driven, a steel wedge, previously inserted in the slotted portion of each bolt, spreads the bolt ends to provide firm anchorage. The bolts clamp the layers of rock together, stabilizing them. Square anchor plates were used for additional support.

In addition to the slotted bolt, Bethlehem also makes a headed bolt for rock control. It has a ¾-in. diameter, and is used with a leaf-type expansion shell.

If you have a rock control problem, we'll gladly work with you in solving it. Just say the word, and we'll have a representative examine the site, and make recommendations. Our nearby sales office is at your service.

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Plan '59

To modernize now for growth and profits

Goes Into High Gear

In 1959, industry will spend more money than ever before to modernize its plant and equipment. But it is not spending enough to do the job that needs to be done.

Manufacturing companies* now plan to spend a total of $24.5 billion on modernization in the four years 1959-1962. This will be enough to replace roughly 70% of the obsolete facilities that were on hand at the beginning of 1959. But it will still leave us far short of our goal. It would take several years, at a higher rate of investment than is now planned, to wipe out obsolescence and give the U. S. a truly modern industrial plant.

These facts stand out from the 12th annual Survey of Business' Plans for New Plants and Equipment just completed by the McGraw-Hill Department of Economics. This new survey shows that industry has made a remarkable start on the modernization job that a previous editorial in this series described as "the most expensive task to be performed in America in this new year of 1959." The full cost of modernization has been found by the McGraw-Hill Department of Economics to be $33.3 billion for manufacturing, and $95 billion for all business.

For the past several months, McGraw-Hill publications have been devoting special attention to new developments in plant and equipment that offer opportunities for modernization. Our special effort to help industry in this regard has been called "Plan '59": to modernize *now* for growth and profits. This editorial will summarize the progress made so far with "Plan '59" and point out some of the areas where business and public policies can do still more to accelerate the modernization drive.

*Excluding petroleum refining, which is reported as part of the oil industry in the data discussed in this editorial.

A Good Start

Business investment in new plant and equipment has picked up sharply since the low point of the 1958 recession. Plans for 1959 now show a 7% increase over 1958 for total capital investment. And the increase in expenditures for modernization is much sharper. Moreover, companies already have substantial plans for the years after 1959. New orders for industrial machinery, which are a good index of modernization plans, also are running well ahead of last year.

For the four-year period 1959-1962, manufacturing companies expect, on the average, to devote 65% of their plant and equipment outlays to modernization. This is the highest proportion reported in a McGraw-Hill survey since 1950. In dollar terms, manufacturing companies plan to spend $24.5 billion on modernization during the next four years.

This is an impressive figure, but it does not look so large when compared with the total need

for modernization in manufacturing industries. As noted above, a previous McGraw-Hill study (conducted in August 1958) found that it would cost almost $35 billion to replace all the facilities that manufacturing companies then considered obsolete. Thus, present plans for modernization are enough to wipe out only 70% of the backlog of obsolete facilities by 1962—and this makes no allowance for the additional facilities that will be made obsolete by new machines and new processes introduced during the next four years. When these new developments are considered, present plans for spending may represent only half the job that will actually need to be done.

How To Accelerate

What can be done to accelerate the drive to modernize our industrial plant and equipment? Two of the greatest aids would be:

(1) Improve present provisions under the tax law for depreciation, to help industry retain more of the money it needs to carry out this massive job of modernization;

(2) Contain inflation, to preserve the purchasing power of the money industry sets aside to replace obsolete facilities.

At first glance, the supply of funds from depreciation allowances appears to be more than adequate. For manufacturing as a whole, depreciation allowances—the primary source of cash for modernization—will total $8.3 billion in 1959, compared with present modernization plans of $6.4 billion. Thus some extra funds will be available to support a further step-up in modernization in 1960.

Unfortunately, however, these depreciation funds are not evenly distributed from industry to industry, or from company to company. For example, in several of the metalworking industries, the prospective flow of cash from depreciation during the next four years is much less adequate than for manufacturing as a whole. These are industries with relatively large modernization backlogs, and they also are industries made up mostly of small or medium-size companies that have difficulty tapping the public money market.

As a result of these industry and company differences, there are many individual cases where shortages of funds limit the amounts of modernization now planned. In the McGraw-Hill survey, nearly half of all companies participating said that they would spend more on new plants and equipment if the depreciation allowances permitted by the tax law were increased substantially over the next few years. Most of these were relatively small companies. Their answers suggest that revision of the tax rules on depreciation should receive the most careful consideration as a spur to faster modernization.

The problem is complicated also by the threat of further increases in the national price level, which would necessarily include prices of capital goods. If "creeping inflation" resumes its march during the next four years, depreciation allowances based on present costs will be much less adequate for future needs. This points up the importance of national economic policies to maintain price stability. Unless this can be maintained, industry's dollars will not go far enough to do the modernization job that is needed.

Plan '59 Carries On

Industry's drive to modernize is now well underway. It can make a key contribution to our national strength and prosperity in 1959 and the years ahead. But the biggest part of this job is before us. It is up to the policy makers—in both business and government—to see that the job is done.

This message was prepared by the McGraw-Hill Department of Economics as part of our company-wide effort to report on opportunities for modernization in industry. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or part of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

NEW compactor has 3500 lb. punch

MORE POWERFUL—the new Master C-12 is loaded with power. *Its 3500 lb. blow is 40% greater than that of most other compactors its size.* At 2500 blows per minute, it does the work of a *15 ton* roller.

Master's new design uses an engine with Stellite valve assemblies that withstand higher temperatures . . . give you more power and longer engine life; a carefully unbalanced heavier eccentric weight for more punch and more overall ruggedness for better operation and lower costs.

EFFECTIVE—produces 90 to 100% Proctor density in granular soil, sand, gravel or rock. Travels forward better in moist soil that often bogs down other compactors. Goes where large machines can't maneuver.

HANDY—no extra man needed; no compressor or hose to haul around.

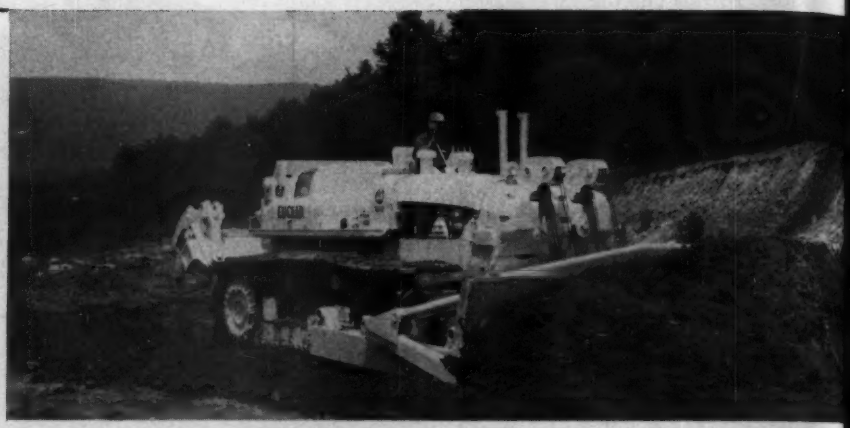
The C-12 is available with 12", 18" or 24" plate or asphalt water shoe. Larger C-36 has 24", 30" or 36" plate. Call your Master distributor or write Master Vibrator Company, Dayton 1, Ohio, for the facts.

MASTER

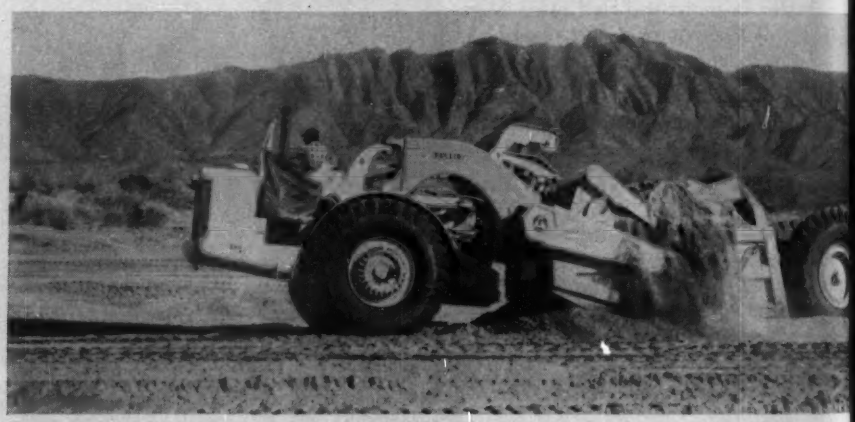
. . . the light construction equipment used by most contractors: bridge deck finisher; vibratory screeds; "1-Man" vibrators; gas and electric powered flexible shaft vibrators; vibratory compactors; 29" power trowel; 34" Powermatic trowels; 34" and 48" Turn-A-Trowels; disc floats, grinding heads; 750 watt to 5KW generators; 125,000, 250,000 and 400,000 BTU heaters.

EUCLID'S BIG 3

TC-12
TWIN-POWER CRAWLER



S-18
21 YD. SCRAPER



TS-24
"TWIN" SCRAPER

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30 yds. heaped . . . 336 h.p. engine . . . 4-speed Torqmatic Drive with converter lock-up . . . independent hydraulic controls for bowl, apron and ejector . . . 27.00 x 33 tires with 33.5 x 33 optional.

Two engines with 563 h.p. . . . separate Torqmatic Drives . . . 24 yds. struck . . . 32 yds. heaped . . . NoSpin differentials . . . all wheel drive . . . unequalled grade-ability.

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Euclid's Big 3 . . . part of an intensive 5-year development program . . . were designed to help you lick the pinch on profits. With big power, big capacity and big performance, each of these "Eucs" provides more work-ability than any other machine in its class. They'll enable you to bid more work . . . small jobs to big projects . . . more profitably. Your Euclid dealer can prove it with *all the facts* . . . you can't afford to make decisions based on partial facts. Be sure to get in touch with him before you buy any new earthmoving equipment.

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GM GENERAL MOTORS EUCLID

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The John Deere Crawler-Loader

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John Deere — Industrial Division

Moline, Ill. — Dept. 558

Take this new "840" Diesel Tractor with the piggyback elevating scraper, for example. Incorporates nearly every proved idea in earthmoving, plus improvements that put it 'way ahead of comparable units in the eight-yard class: Semi-integral construction greatly increases maneuverability, puts plenty of weight where it's needed, over the tractor drive wheels. Compact size permits U-turns between standard 30-foot curbs. Loading the bowl from the top, the power elevator eliminates need for push-loading, breaks up the soil for fast, smooth hydraulic ejection. Narrow unit width makes it possible to drive the rig on highways of most states without a permit.

There's good news for dollar-conscious operators in both the operating economy and purchase price of this unit, too. Available on terms of the John Deere Credit Plan, this is one key cost-shaver you can get on your jobs in a hurry. See your John Deere Industrial Dealer for the information you need, or write today.

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

The contractor sprayed concrete over reinforcing and lath draped between long cantilevered girders to form a canopy structurally independent of the building underneath.

Concrete Roof Needs No Forms

A CONTRACTOR in Atlanta has draped 275 tons of concrete over eight steel girders to form a canopy roof with catenary arches.

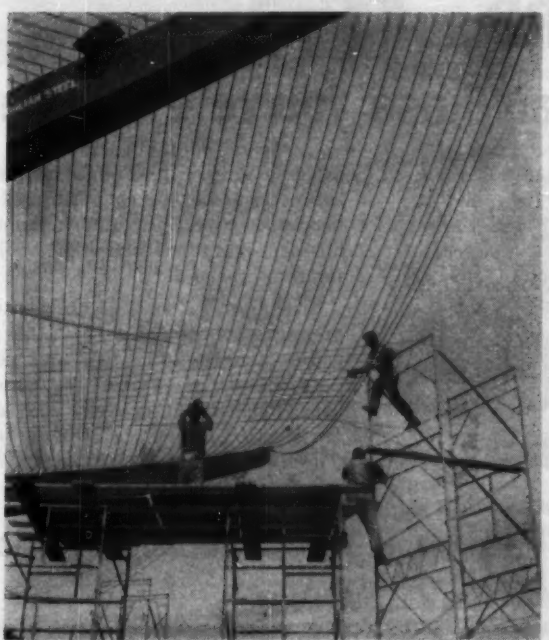
Lenox Contracting and Engineering Co. built the unusual roof for a Gulf Oil Co. filling station at the new Lenox Square Shopping Center in Atlanta.

Each girder cantilevers out from a single column and is connected at the center of the roof to an octagonal compression ring, or spider. The canopy is structurally independent of the building erected under it later.

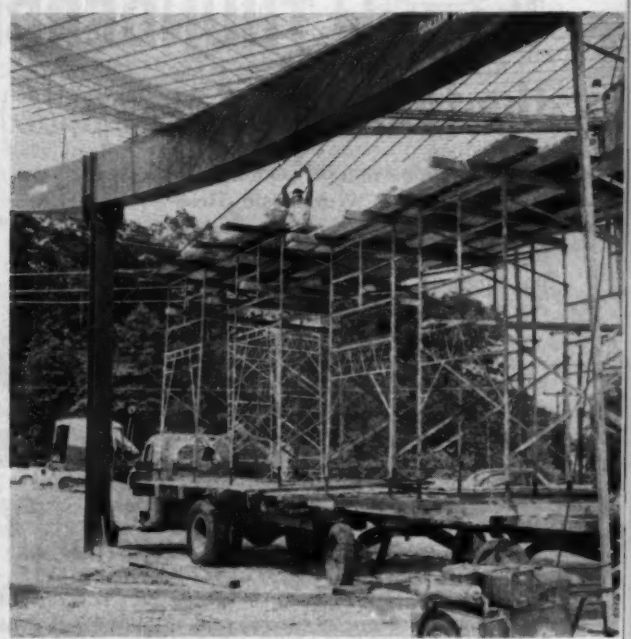
Job Starts

Lenox first poured 5½-ft-sq reinforced concrete footings 14 in. deep over granite bedrock. Steel erection was handled by Jim Hurst Steel Erectors of Atlanta with a Lima 64 truck crane. Hurst set up eight 14WF78 steel columns 20 ft long to support the roof girders. This work went fast. A little more difficult was the erection of the spider and girders.

The spider was made up from ½ to 1½-in. steel plate sections welded to I-beams in an octagonal shape. Its purpose was to serve as center support for the curved roof girders. To put it up, Hurst set up a center shoring system made up of Patent tubular steel scaffolding supplemented with 6x6-in. timbers to support the spider until girders could be welded to it. To guard against upward thrust of the girders, Hurst

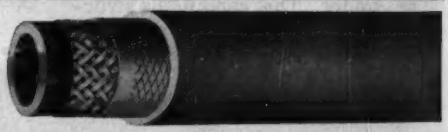


REINFORCING—Workmen atop Patent tubular scaffolding towers tie No. 2 reinforcing rods to underside of curved No. 3 rods.



SCAFFOLDING—Two flat-bed farm wagons pulled by an International truck support scaffolding to form a mobile platform.

Quaker Thermoid THUNDERBIRD...



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THUNDERBIRD takes this punishment while remaining the most flexible, non-kinking air hose you've set eyes upon. Accurately-controlled angle of wire braid assures this extreme flexibility. Tough neoprene tube resists hot or cold oil. Yellow neoprene cover provides maximum abrasion-resistance and high visibility even in the dark.

Sizes from 3/8" to 4" I.D. Working pressures to 400 psi air or 2,000 psi water. Lengths to 50 feet. Ask your Thermoid distributor about THUNDERBIRD, or write *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Phila. 24, Pa.*

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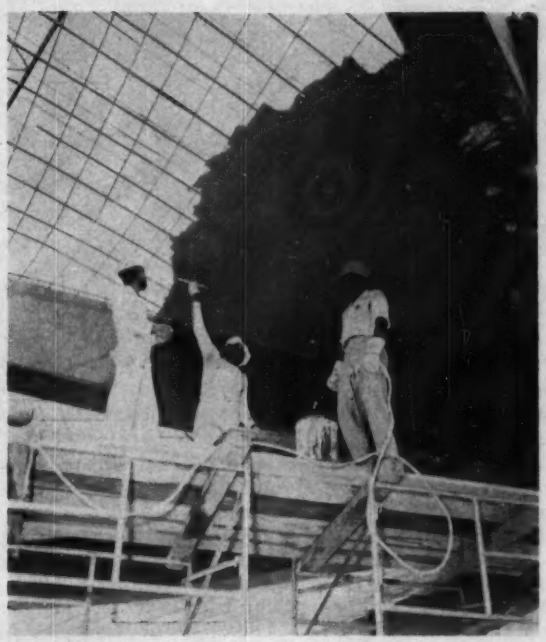
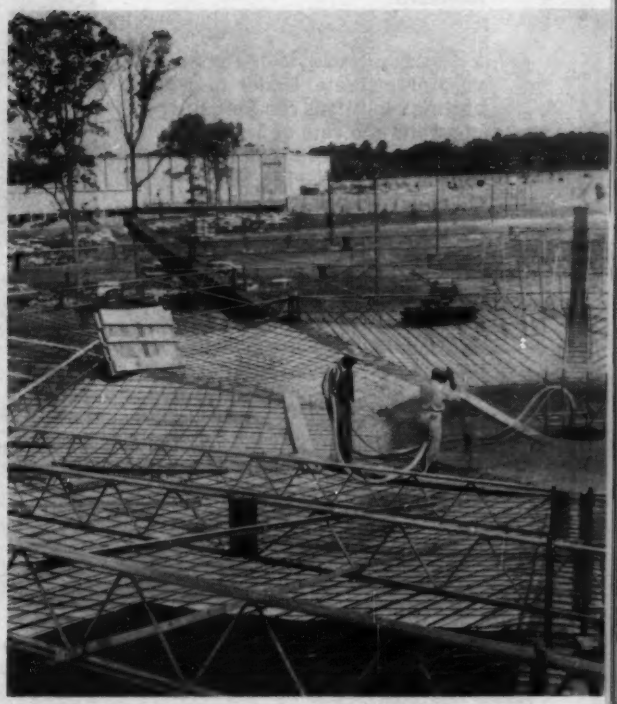


PLASTERING—Plasterers on mobile scaffolding hand trowel a brown coat of portland cement mortar to underside of lath.



CONCRETING—Two men working a Tru Gun-All G-4 spray a 1:3-mix concrete with asbestos added over roof-top reinforcing steel.

anchored the spider down with four ⅝-in. steel cables tied to the four closest column bases.

The reinforced box girders are 3 ft deep at the column points, 2 ft deep at the spider, and 1 ft deep at their cantilevered ends. They were bent into shape with hydraulic jacks by Golian Steel and Iron Co. of Atlanta. Bending gave each a 13-ft upsweep.

Four of the girders are 71 ft long while the other four measure 61 ft each. Longer girders were erected first. One was lifted, tied into the spider and the column temporarily with compression bolts, then welded into place. The girder opposite it went up next. After all four long girders had been placed, the shorter ones were erected in the same pattern —first one girder, then the one opposite it.

Workmen set up a tubular steel rods between adjacent girders and connected them to the girders. From each tower they stretched a length of piano wire and attached it to the spider. At the scaffolding tower each wire was 6½ ft above the spider grade and 6½ ft below the grade of the girder ends. The wires served as guides for setting the center sag between girders.

Workmen then draped No. 3 steel rods between adjacent girders and connected them to the girders with 2-in. welds. The rods were spaced on 6-in. centers at the girders' cantilevered ends. Spacing of the bars widened toward the spider to a maximum separation of 13 in.

Place Reinforcing

Considerable care had to be taken in placing the bars. Only 10 rods could be placed in one bay at any one time for fear of upsetting the delicately balanced structure.

"If those guys get No. 3 bars in one bay more than 10 strands ahead of the other bays," said a job engineer, "that structural steel could fold up like a Japanese fan."

Further reinforcing was added by tieing No. 2 temperature steel rods on 10-in. centers to the underside of the No. 3 steel with 14-gage tie wire. To the underside of the No. 2 steel workmen wired a final reinforcing of 3.4-lb galvanized steel lath. Steel ¾-in. spacer bars placed between the No. 2 bars and the lath at 18-in. intervals kept the lath separated from the bars.

Mobile scaffolding aided workmen setting reinforcing. Lenox bought two 6x18-ft flat-bed farm wagons and hooked them up in tandem. On each wagon, Lenox erected a work platform 5 ft sq and 20 ft high of Patent scaffolding. Planking across the top of the towers provided a work station for the iron workers.

An International truck pulled the tandem trailers around under the steel. The truck's flat bed, at one point in the construction, also was fitted out with scaffolding to increase the platform area.

With reinforcing completed, plasterers, working atop the mobile scaffolding, hand-trowelled to the underside of the lath an initial ⅛-in. brown-coat of portland cement mortar. This was to keep later sprayed-on concrete from blowing through holes in the lath.

Spraying on of concrete started at the center of the canopy. The 16,500-sq-ft roof was concreted 2½ in. thick. Five men handled the operation. Two men worked a Tru Gun-All G-4 that sprayed the concrete while three men on the ground operated the batcher and a Schramm 315-cfm compressor that supplied air for the gun.

Concrete was a 1:3 mix with

ROOF NEEDS NO FORMS

continued

3 lb of asbestos added to each yard of concrete. Under best operating conditions concrete spraying went at a rate of 5 yd of concrete in place every hour. Total concrete needed—275 tons.

Lenox originally planned to concrete in several distinct stages. They intended to concrete at the column line, wait for this concrete to cure, then use the dry slab as a work station to spray the remainder of the roof in 6-ft increments. That would have been a time-consuming method. So Lenox decided, instead, to weld open-web steel joists to temporary 1-in. steel rods welded to the girders. They placed three rows of the joists to hold timber catwalks for the concrete crews. With this method, they were able to complete the concreting in only four working days.

Scratch Coat

At the completion of concreting, plasterers hand-trowelled a second ½-in. scratch coat under the lathing. When that coat dried, they sprayed a final ⅛-in. coat of finished plaster to the under side with a small hand gun.

Runoff of rain water will be handled by an 8x8-ft copper splash pan 18 in. high set inside the spider. An 18-in. drain pipe will run from the spider down through the filling station out and to a storm drain. The station structure itself will be a 54-sq-ft concrete block building with steel framing.

Canopy cost was $36,000, or $3.25 psf to erect. Overall cost of the station will be $76,000. V. A. Schroeder is project manager for Lenox. King Royer is general superintendent, and Harry Shaw is job superintendent.

SUPPORTING—Lightweight joists temporarily bridging girders will be crossed by scaffold planks to support two-man crew that will spray concrete over the brown coat.

DIESEL RELIABILITY

The most important thing your equipment dollar can buy

American MARC offers the construction industry a full line of completely dependable diesel powered equipment for pumps, compressors, hand tools, welding equipment and field lights—Ultra-lightweight diesel engines 9 to 18 HP, air and water cooled; Diesel electric generator sets, 2½ to 10 KW, AC and DC; Generators, ½ to 100 KW, 400 and 60 cycle, permanent magnet and static excited types; Natural gas engines, 2 cylinder, 15 HP, air cooled.

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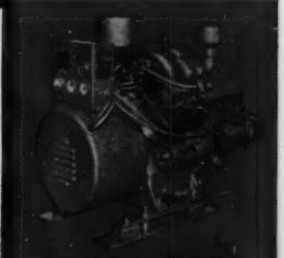

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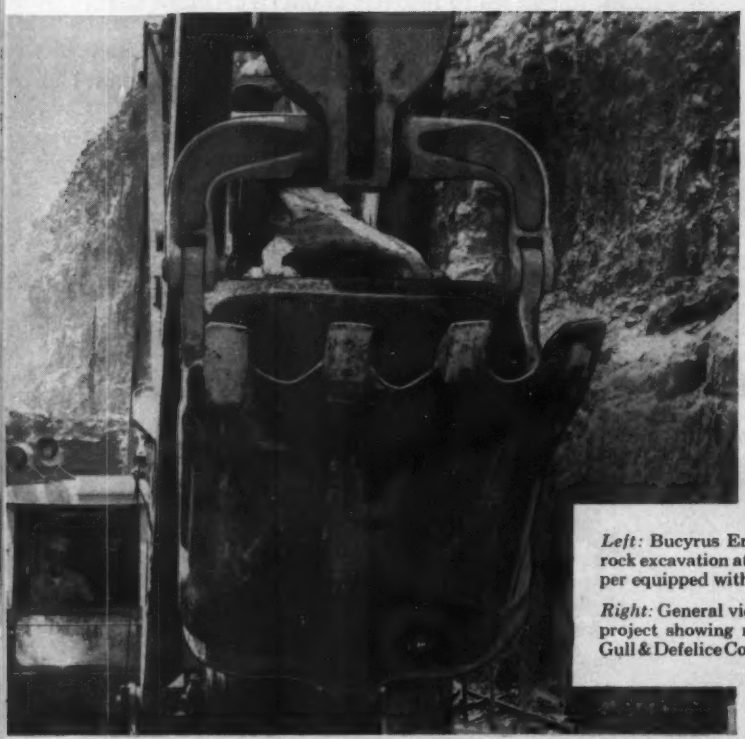
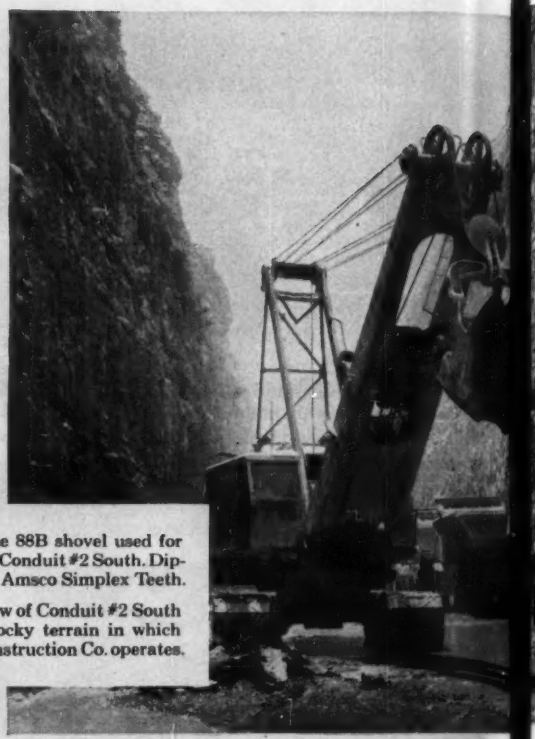
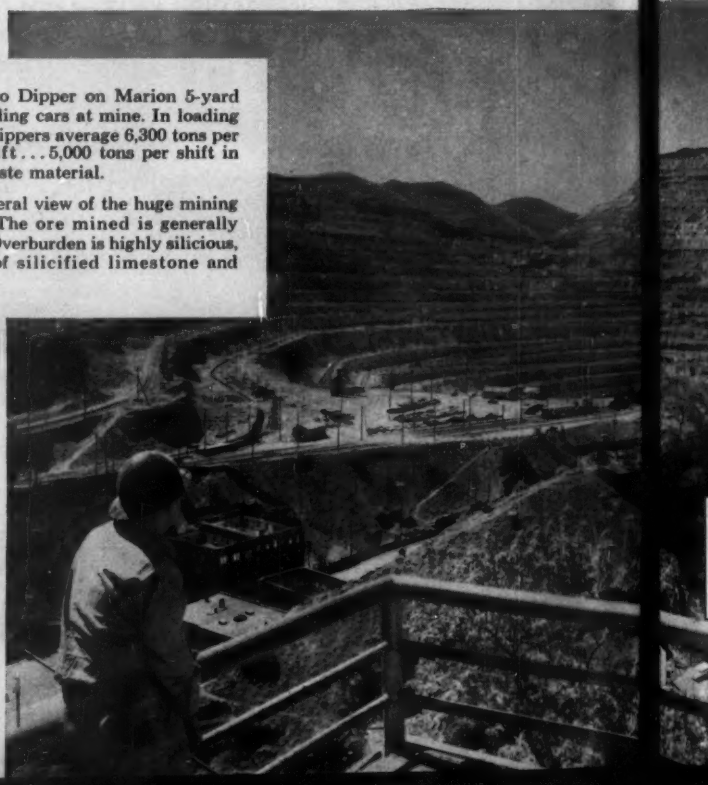
How AMSCO helps you MOVE





Left: Bucyrus Erie 88B shovel used for rock excavation at Conduit #2 South. Dipper equipped with Amsco Simplex Teeth.

Right: General view of Conduit #2 South project showing rocky terrain in which Gull & Defelice Construction Co. operates.



Left: Amsco Dipper on Marion 5-yard shovel, loading cars at mine. In loading ore, these dippers average 6,300 tons per 8-hour shift . . . 5,000 tons per shift in working waste material.

Right: General view of the huge mining operation. The ore mined is generally porphyry. Overburden is highly silicious, composed of silicified limestone and quartzite.

MORE TONS PER DOLLAR

Read these user reports on how AMSCO Dippers and Teeth perform in rugged digging service

ON THE NIAGARA POWER PROJECT

40,000 YARDS OF ROCK HANDLED BEFORE AMSCO 2-PART TEETH NEED REPLACING

Gull & Defelice Construction Co. is working on Section 3 of the powerhouse conduit project – excavating 140 feet deep, almost entirely in rock. All five power shovel dippers on the job are now equipped with Amsco Simplex 2-Part Reversible Teeth.

These dippers work *16 hours a day, 6 days a week for 2 weeks—handle approximately 40,000 yards of rock*—before tooth replacement is required.

Says Mike Cazzolla, Equipment Superintendent, in talking about the Amsco teeth: "They're built rugged and take a lot of punishment from the rock. We get longer wear out of them because we can turn them over." He's referring, of course, to the reversible tip feature.

John Cazzolla, Master Mechanic, adds the important fact that *they can replace these teeth in ten minutes with no trouble.* This feature, together with the longer wear, means important savings in downtime.

AT ONE OF WORLD'S LARGEST COPPER MINES

THEY USE AMSCO DIPPERS ...FOR HIGH-SHOCK, HIGHLY ABRASIVE DIGGING

This huge copper mine operates the largest collection of big power shovels (5 yards and up) in the world. For this rugged service they use Amsco dippers to strip off extremely abrasive overburden ... handle waste material ... and load copper ore. These are cast manganese steel dippers – built for toughness, high abrasion resistance and long service life.

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... wherever high impact and abrasion are problems, you'll "move more tons per dollar" with Amsco Manganese Steel Dippers and Simplex 2-Part Reversible Teeth. See your power shovel equipment dealer for sizes and types available. Or write us direct for technical bulletins on Amsco Dippers and Simplex 2-Part Teeth.

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Sinclair Tenol® Motor Oils

New Tandem Roller Units

With two pairs of rollers mounted in tandem, these machines compact fill in half the normal number of passes. R. G. LeTourneau rig (above) has diesel-powered generator, electric motors on each roller. Ferguson rig (below) is driven by diesel engines.

A new type of sheepsfoot roller unit is cutting compaction costs up to 50% on this dam job. And two modified loaders are making cuts up to 14 ft deep.

Earth Dam Job Tests New Rigs

Modified Loader Makes 14-Ft Cut

Extra plow mounted on Euclid self-elevating loader enables it to cut 14 ft into stratified borrow pit, mixing layers of earth to meet specifications as it digs the fill.

TWO MANUFACTURERS' versions of a new sheepsfoot roller unit and a pair of contractor-modified elevating loaders are the equipment showpieces on the construction of Foss Dam in Oklahoma.

The self-propelled roller units have two pairs of sheepsfoot roller drums mounted in tandem. They are reported to cut rolling costs as much as 50% over conventional towed rollers. Several months ago, the Shovel Supply Co. of Dallas built the first of these units,—a diesel-powered rig,—and tested it on another dam project (CM&E, Aug., p. 74). The model at Foss is an improved version of that machine. Now R. G. Le Tourneau has two electric-powered machines of the same type working at Foss.

The loader is a Euclid elevating type that normally cuts to a depth of 4 ft. The contractor modified it to cut 14 ft so that it mixes several strata of borrow material as it cuts and loads the material.

Foss Dam is a Bureau of Reclamation earthfill dam project. It

is one of two dams in the $41-million Washita Basin Project. Located on the Washita River about 20 mi of northwest of Clinton, Okla., Foss Dam will provide irrigation and water supply for nearby communities, as well as flood control on the Washita River.

Wunderlich Contracting Co. of Palo Alto, Calif., has a $7.3-million contract to build Foss Dam. The dam will be a rolled earth-fill embankment with riprap on the upstream face and topsoil on the downstream side. Height above the stream bed will be 134 ft and crest length will be 18,200 ft. Total fill required will be 10,000,000 cu yd. Wunderlich started work in February, 1959; they are scheduled to finish the job in the summer of 1961.

FIRST MODEL—Rigs at Foss were patterned after this trial model now in use at Navajo Dam. Biggest change in later types is to mount the engines in between the rollers.

Ferguson Tamper

Shovel Supply Co. describe their rig as a Ferguson Model SP96M self-propelled tamping roller. It has four individually powered drums, each 6 ft in dia and 6 ft long, mounted on an all-welded frame with a central operator's cab.

Bureau of Reclamation specifications call for placing the fill in 6-in. lifts and rolling it with 12 passes of a roller weighing not less than 4,000 lb per ft. The Ferguson rig weighs 132,000 lb when fully loaded with water, or 5,300 lb per ft of drum. The drums have a center bulkhead so that only half of the drum need be filled. Normally only the inboard half is filled to give a pressure of 4,700 lb per lin ft.

Each drum contains 168 removable feet set in eight rows of 21 each. The feet are standard Bureau of Reclamation design, 10 in. long with a 3-in. dia hard-faced tip.

Each roller has its own 125-hp General Motors diesel engine. The engines are located in the central part of the rig to prevent damage. On the first machine, the engines were outside the rollers; that made them susceptible to possible damage from minor collisions.

Each engine has a 12-v generator, starter, battery, oversize fan, dual oil coolers, and automatic shut-down for high water temperatures and low oil pressures. A 75-gal fuel tank for each engine carries enough fuel for 10 hr of operation at full load.

Transmissions are Allison CRT-

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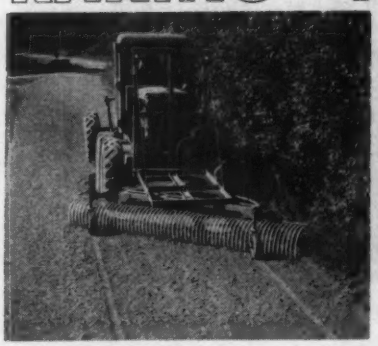
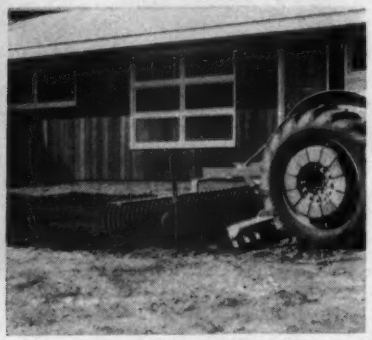


YORK POWER GRADER RAKE—
For fast grading and raking. Fits all heavy-duty graders . . . folds out of way when idle.



YORK MODEL RE RAKE WITH SCARIFIER—
This York combination speedily performs most landscaping and lawn-building jobs.

York Rakes help you get more profit from grading and landscaping

Thousands of contractors are proving daily that YORK RAKES are profit-builders.

These rugged rakes will handle almost any soil-working and finishing job: rough grading . . . removing roots, stones, debris . . . spreading topsoil . . . pulverizing and mulching . . . terracing . . . building road shoulders and malls . . . spreading crushed stone and gravel.

YORK RAKE, MODEL PG attaches to most heavy-duty motor graders, doubles the efficiency of your grader . . . follows the grader blade, gives a smooth even surface without extra trips. Unit is ruggedly built for trouble-free service.

YORK RAKE, MODEL RE fits all 3-point hitch tractors. Scarifier attachment (optional) breaks up hard-packed ground, rips out roots and stones. Lifts out of way when not in use.

YORK RAKES, MODELS RA and RB (trailer-types) also available for use with regular motive power.

Let YORK show you how you can save time and labor, do a better grading job.

It Costs You Nothing To Get the Facts!
Write Dept. CM-99 today for literature and name of your nearest distributor.

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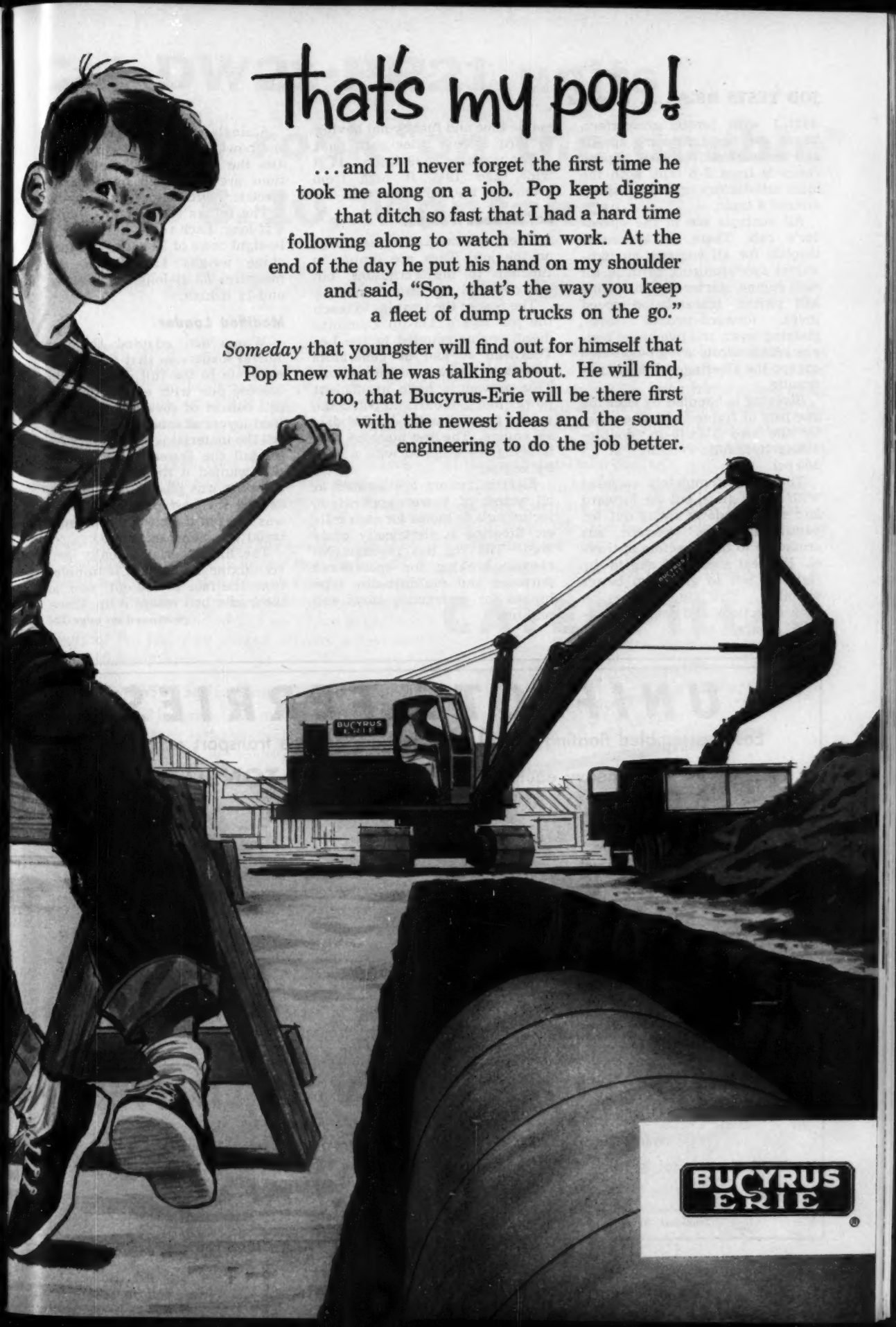
That's my pop!
...and I'll never forget the first time he took me along on a job. Pop kept digging that ditch so fast that I had a hard time following along to watch him work. At the end of the day he put his hand on my shoulder and said, "Son, that's the way you keep a fleet of dump trucks on the go."
Someday that youngster will find out for himself that Pop knew what he was talking about. He will find, too, that Bucyrus-Erie will be there first with the newest ideas and the sound engineering to do the job better.
BUCYRUS ERIE

JOB TESTS RIGS . . . *continued*

3331-1 with torque converters. There are three forward speeds and three reverse speeds. Speed range is from 2-6 mph with the most satisfactory operating speed around 4 mph.

All controls are in the operator's cab. There is a master throttle for all engines, an individual synchronizing throttle for each engine, starter switch, engine kill switch, transmission speed lever, forward-reverse lever, steering lever, and two brake pedals. All controls are air-operated except the steering, which is hydraulic.

Steering is handled by skewing one pair of frames with the other by the two 5½x40-in. double-acting hydraulic cylinders at 1,200 psi.

The cab is completely enclosed with safety glass, but the forward and rear windows swing out for ventilation. The operator sits crosswise to the direction of travel. His seat swings 15 deg to the right or left to give him better visibility. The rig operates in both directions and saves considerable time and fuel by not having to turn around after each pass.

The machine is 39 ft long, 17 ft wide, and 12½ ft high from ground to the top of the cab.

LeTourneau Tamper

There are two LeTourneau rigs on the job. They are similar in function to the Fergusons, but are powered by electric motors.

The first of the two rigs to reach the job had a 335-hp Cummins diesel engine coupled to the LeTourneau ac and dc generators that supply power to the motors. This proved to have insufficient power and LeTourneau fitted the second rig with a 420-hp GM diesel engine. The first machine now is being re-equipped with a 420-hp engine.

Electric motors are located at all points of power application, including a dc motor for each roller. Steering is electrically powered. The rig has regenerative electric braking for operational purposes and multiple-disc type brakes for emergency stops and parking.

A single control governs speed and power. Another control handles the brakes. All other functions are controlled by fingertip electric switches.

The rollers are 6 ft in dia and 6 ft long. Each roller has 184 feet in eight rows of 23 each. The machine weighs 112,000 lb, and measures 33 ft long, 16 ft wide, and 11 ft high.

Modified Loader

Wunderlich adapted the two Euclid loaders so that they could excavate to the full depth of the borrow pits with each pass. The pits consist of several well-stratified layers of sand, silt, and clay. All the material is satisfactory for fill but the Bureau of Reclamation wanted it thoroughly mixed before it was placed. Wunderlich figured the best place to do this was right in the pit while the material was being excavated.

The fill material actually gets six mixings: one, as it is tumbled from the face of the cut; two, as the loader belt scoops it up; three,

continued on page 167

UNIFLOTE FERRIES

Easily assembled floating *UNIFLOTE* sections provide transport across water

for heavy equipment — **UP TO 100 TONS!!**

Using 8 UNIFLOTES plus 4 ramp, 4 bow and 2 stern units this ferry was quickly assembled using unskilled labor. Ferry and 30-ton equipment load took draught of only 5" and was propelled by a 150 h.p. outboard motor. Sections are tilted to couple at bottom, then pinned through eye holes at top. Other uses: floating platforms for derricks, cranes, draglines and pile drivers. Landing stages, wharves, piers, etc.

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Cat DW21-PR21 units handle rock "on the double" on U. S. 10, Montana

When Albert Lalonde Company, Sydney, Montana, was awarded a $1,537,337 contract on a four-mile section of U. S. 10 on the Interstate System, three Cat DW21 Tractors with Athey PR21 Rear Dump Wagons were purchased for hauling the rock. A. M. Stolzenburg, Superintendent, tells why: "We ran three seasons with them in rock jobs. Now that we're back in rock again, we bought some more. They're big, rugged and an easy shovel target, have a low center of gravity and are maneuverable."

Note how these features met the conditions on this job. The units had to work in limited room on benches and steep haul roads. Material handled for fill included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour. At the start of the job, they worked 8 hours a day; to finish it, 16 hours a day.

New DW21 Series G now 345 HP

Now a new DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Super-Turbo Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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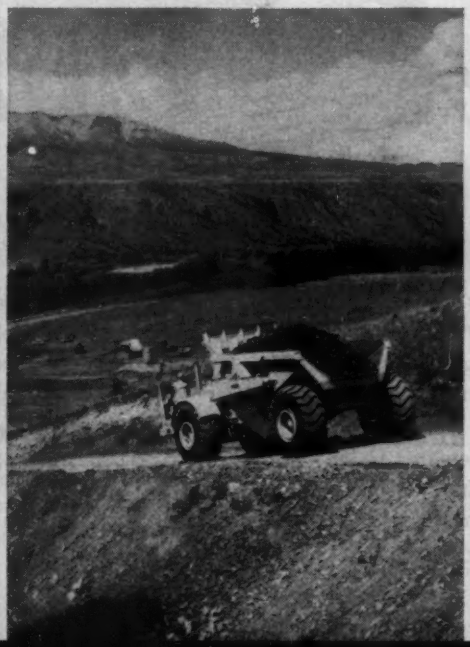
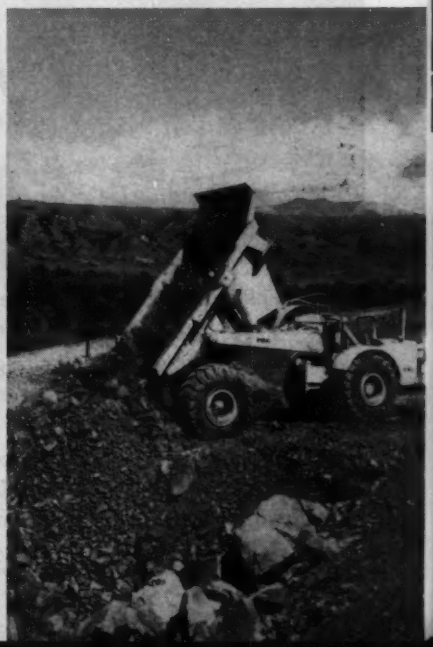
THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.



DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.



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as it pours into the wagons; four, as it is dumped onto the fill; five, as the bulldozers spread it; and six, as the sheepsfoot rollers compact it.

To increase the normal 4-ft cutting depth of the loader to 14 ft, Wunderlich increased the height of the regular vertical cutting blade and installed a 48-in. mouldboard plow above and back of the first blade.

The lower plow functions the same way as it does on a standard loader. The upper plow excavates and deposits earth directly onto the conveyor belt above and back of the lower plow.

Wunderlich had to modify the original frame somewhat to fit on the second plow. They cut away one straight beam in the frame and replaced it with a curved beam. They also reinforced the plow with steel bars. An extra set of tracks on the side of the loader that the blade is on takes care of the added load imposed by the deep cutting.

The modified machine takes an 8-12-in. bite into the bank compared with the normal 2-ft cut. It doesn't handle more earth than the standard rig but it provides the thorough mixing that BPR requires.

A Cat D9 tractor pulls each loader. Another D9 services the pit area and keeps all equipment moving. To open a pit, a loader starts in the center and works in a circle. The circular run means no loss of time turning around.

The loaders feed eighteen 25-yd Euclid bottom dumps that can carry up to 30 cu yd heaped and 13 Cat DW21 scrapers equipped with side bars to increase their capacity to 30 cu yd.

Loading time is about 45 sec for a 30-yd machine. Wunderlich estimates that they can make up to three loads with the loader for every one load they could make with a push-loaded scraper. So they don't use the scrapers for anything but haul units. But it is convenient to have them around; in the event of a loader breakdown they could take over temporarily and load themselves with the aid of a pusher tractor.

The earthmoving spread can excavate and place earth fill at a rate of 3,300 cu yd per hr. Haul distances are less than 3,000 ft. There are three pits in operation. One has a capacity of 2,000,000 cu yd, the second contains 7,500,000 cu yd and the third will supply 500,000 cu yd.

STARTING A PIT—Cat D9 tractor hauls loader on shallow cut. Loader starts at center of pit, quickly cuts down to 14 ft depth as it works outward in circular path.

LOADER DETAILS—Lower plow has been enlarged and a second plow has been added to enable machine to cut to 14 ft. Steel frame of loader has been modified slightly.

Preparing the Fill

Wunderlich irrigates the borrow pits before they start excavating to bring the fill up to optimum moisture content. They also sprinkle the fill after it has been placed and before they roll it.

For sprinkling the fill in place and for maintaining haul roads, Wunderlich uses two extra large water trucks, specially made for earth dam construction. Each has a capacity of 11,700 gal and is filled and emptied by a standard 6-in. pump. The rear pressure spray from 16 nozzles covers a 40-yd width. A Euclid tractor hauls each rig.

The specifications call for free draining sand on the downstream side of the dam. Wunderlich has to remove clay from the sand on the site before it is suitable for this purpose.

They do it with Atcheson twin 7-in. screw classifiers. A 6-in. centrifugal pump provides 1,000 gpm of water for washing the sand. Kolman conveyors and screws then feed the washed material through the plant.

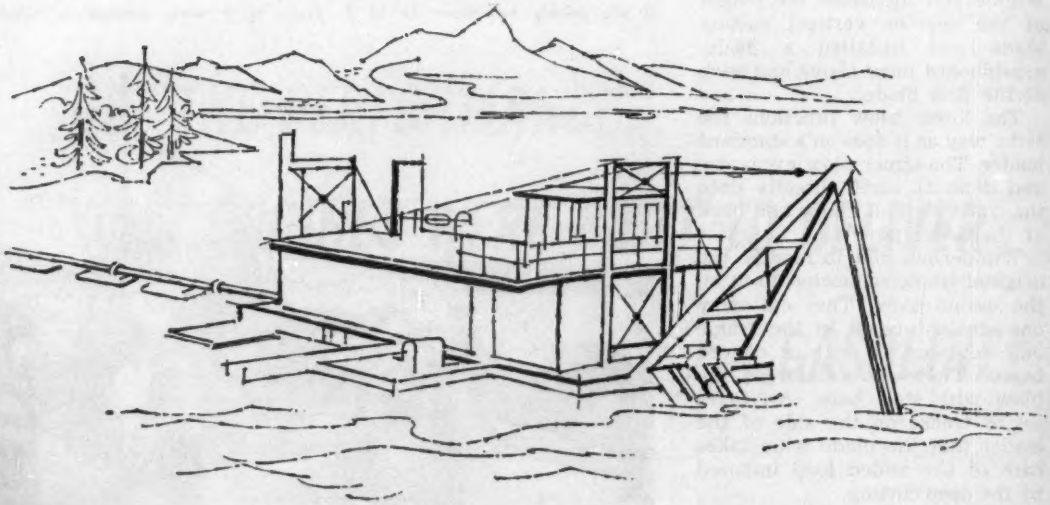
On an earth fill job, rains and storms can cause trouble. Wunderlich keeps in close touch with the Weather Bureau in Oklahoma City. The bureau tracks storms with radar and warns the contractor when one is approaching the job site. On receiving the warning, the contractor grades down the embankment to prevent water from collecting in holes. If the rain lasts only a short time, as it often does, the crews can start work again almost as soon as it is over. Wunderlich also grades down the fill each night as a precaution against sudden storms.

Of course, this system doesn't make much difference in a long heavy rain. The job would be shut down in that case no matter what they did. But the system works effectively for short storms and showers, and it has saved a lot of time. At present the job is 31% complete in only 21% of the scheduled time.

Men on the Job

John New is project manager for Wunderlich. C. O. Crane is project manager for the Bureau of Reclamation.

What makes dredging profitable?



The key to profitable dredging is the prospective owner's selection of the right dredge for his project. How can a purchaser, then, be assured that he is making a sound investment in dredging equipment and not taking a gamble? After all, dredges are purchased to make, or to save, money.

First the buyer should have expert advice to help him determine what type and size of dredge is best suited to the job at hand. Then he has a right to know the exact cost of the dredge, what it will do and what it will cost to operate. He should be completely certain that he is buying a machine that will be competitive, not only when new, but after many years of faithful service.

To get these assurances, he should expect the dredge to have been designed and built under a single engineering and manufacturing responsibility that will guarantee quality and performance.

When considering these factors, he should ask himself, "What sort of an organization is back of a dredge to see that I am getting one of the best value?" Ellicott answers that by the performance record of their dredges designed by experts who have taken and will continue to assume complete responsibility for dredge design, manufacture, and operation.

Nothing can replace that specialized experience, now approaching the 75 year mark. The purchaser of an Ellicott dredge will know *in advance* what his investment will be.

When you are planning a dredging job, take advantage of this experience. Talk *first* to Ellicott and get equipment recommendations based on *your* job requirements. It will mean the difference between profitable dredging and the other kind.

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Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

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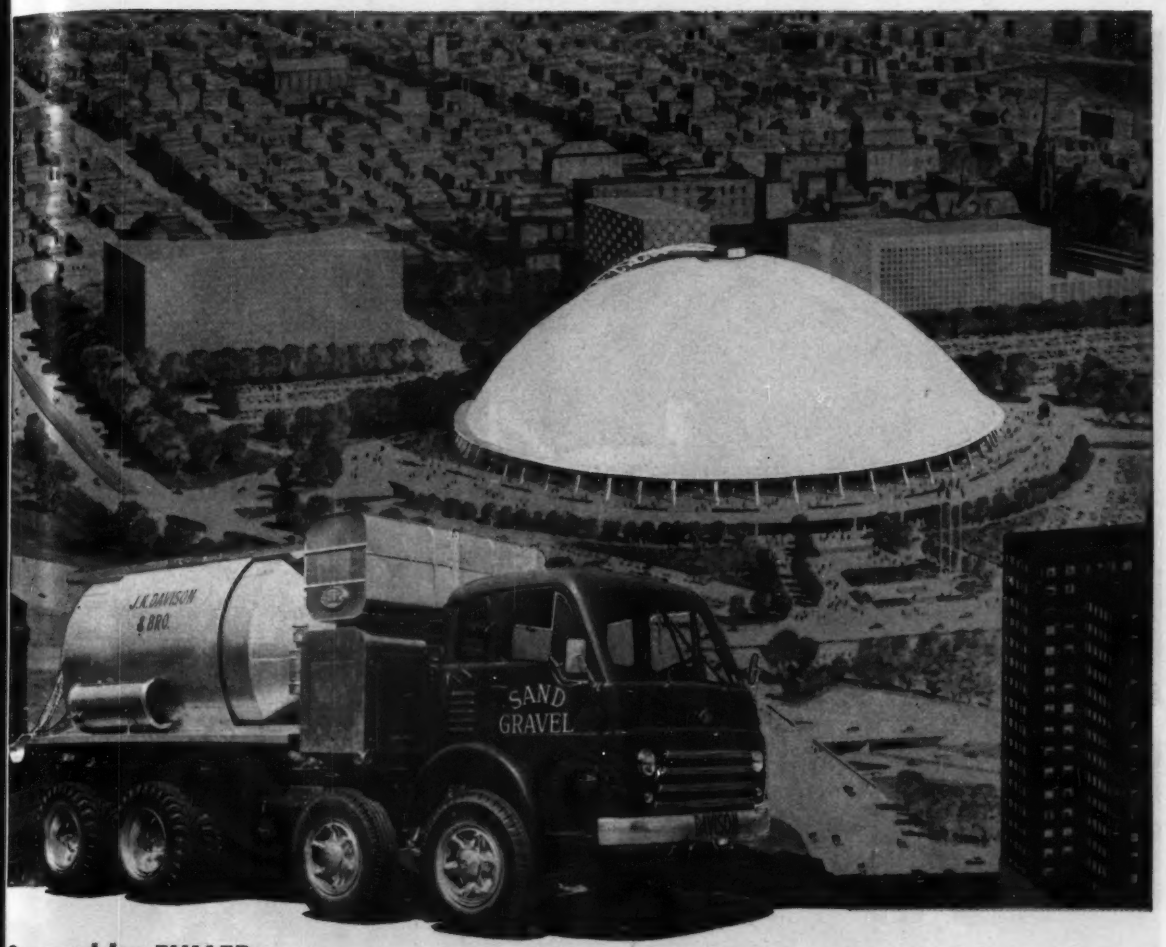

Geared by FULLER...

Davison's rigs move more payload in less time

J. K. Davison & Bro., Pittsburgh, one of the largest ready-mix purveyors in western Pennsylvania, is supplying concrete for the Steel City's gigantic new civic-sports arena.

To increase the capacity of their ready-mix fleet, Davison recently purchased two high-payload Diamond T trucks with 8-yard mixers, 212 hp engines, Fuller Model 5-A-65 5-speed Transmissions and Eaton-Hendrickson Model 38DS Tandem Rear Axles.

Selected because of their proven reliability and ease of operation, the Fuller 5-A-65 Transmissions help provide the proper gear ratios for high maneuverability on congested job sites as well as added flexibility in city traffic.

Davison's new trucks feature four-axle construction, permitting GVW of 60,000 pounds. Because chassis weight has been held to 16,000 pounds, high payloads are possible . . . and because the Fuller 5-A-65 Transmissions permit the operator to select proper gearing for every situation, Davison is able to hustle more ready-mix to the job in less time.

There is a Fuller Transmission designed to put more profit in *your* operation. For details, contact your truck or equipment dealer.

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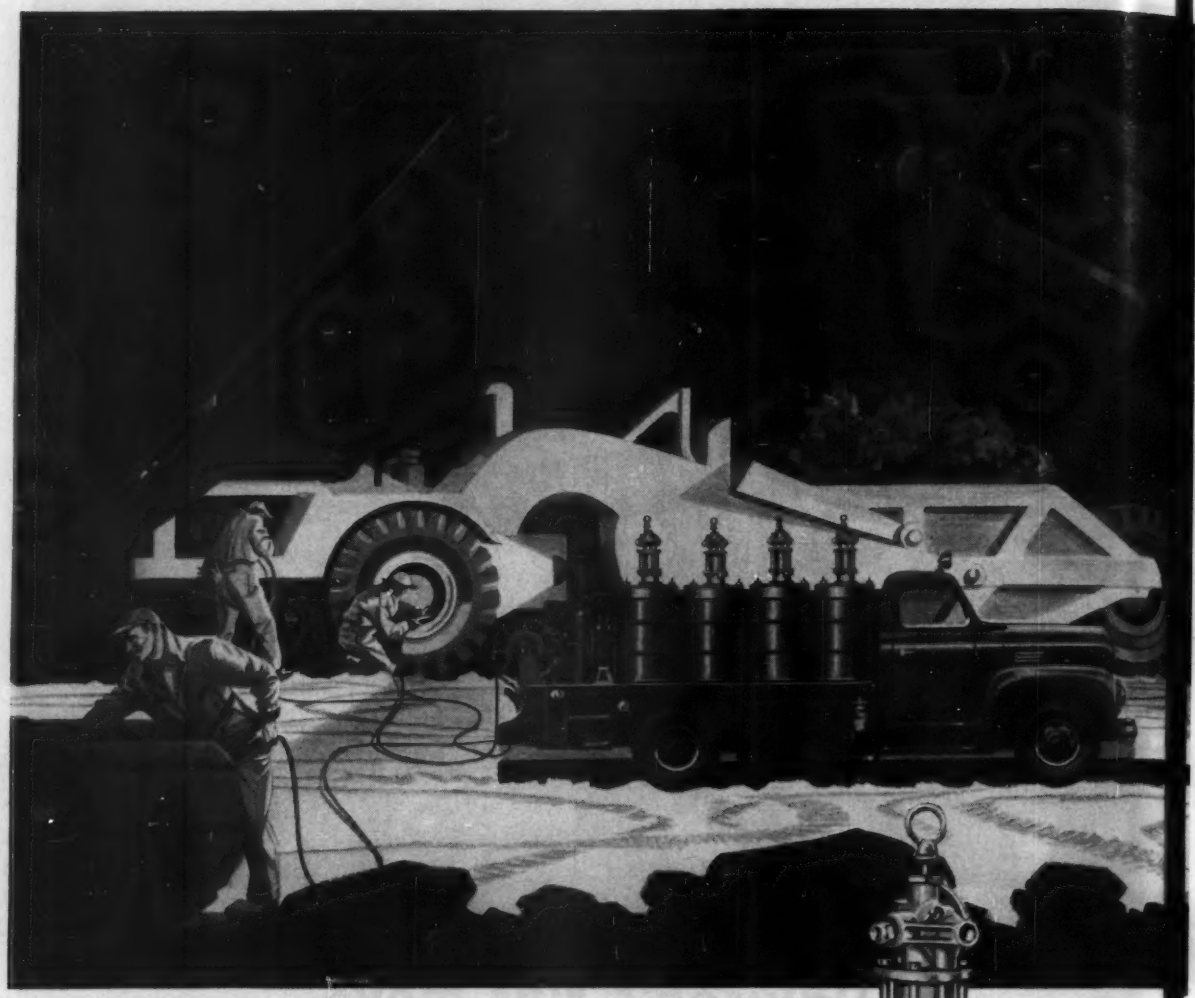

New "77" Pump Brings 68% More Lubricant Pumping Power to Alemite Portable Service Stations!

The all-new 5.2 horsepower "77" Pump is the most powerful air-operated pump on the market! Assures rapid, positive delivery through longest lines.

THREE POWERFUL MODELS for unequalled delivery of all lubricants! High-pressure model for light-bodied and fibrous greases • Medium-pressure model for heavyweight oils and light-bodied greases • Volume delivery model for light-bodied fluid lubricants.

ALL-NEW "77" FEATURES! • Unmatched Performance—Delivers up to 19.7 lbs. per min. of light-bodied lubricant or 14.4 lbs. per min. of fibrous lubricant! • **New Lightweight Air Cylinder** is high strength aluminum—pump weighs only 58 lbs.! • **Greatest Horsepower and Highest Efficiency** with new design air motor—has greater volume air distributing valve, instant-trip toggle, extra-large straight-line exhaust. **More delivery, no surge, no binding.**

NOW...EVEN

more power

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ALEMITE PORTABLE SERVICE STATIONS

Your Valuable Rigs Get Round-the-Clock Protection with fast, efficient On-the-Job Lubrication!

MORE TIME SAVED TO MEET TIGHT SCHEDULES! Cutting maintenance time and costs on major road jobs throughout the United States and Canada, Alemite's portable power units lubricate all types of construction equipment *on the job*—wherever and whenever service is needed. These versatile, rugged units eliminate costly delays due to slower lubrication methods . . . end time-consuming trips to and from the grease shop . . . reduce chances of costly bearing failure.

Whether your spread is large or small, an Alemite outfit can be custom-built from standard Alemite equipment to meet your particular needs . . . and to give you important savings in time, money and equipment.

Write Today for Complete Information on Alemite Portable Service Stations!

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STEWART-WARNER CORPORATION

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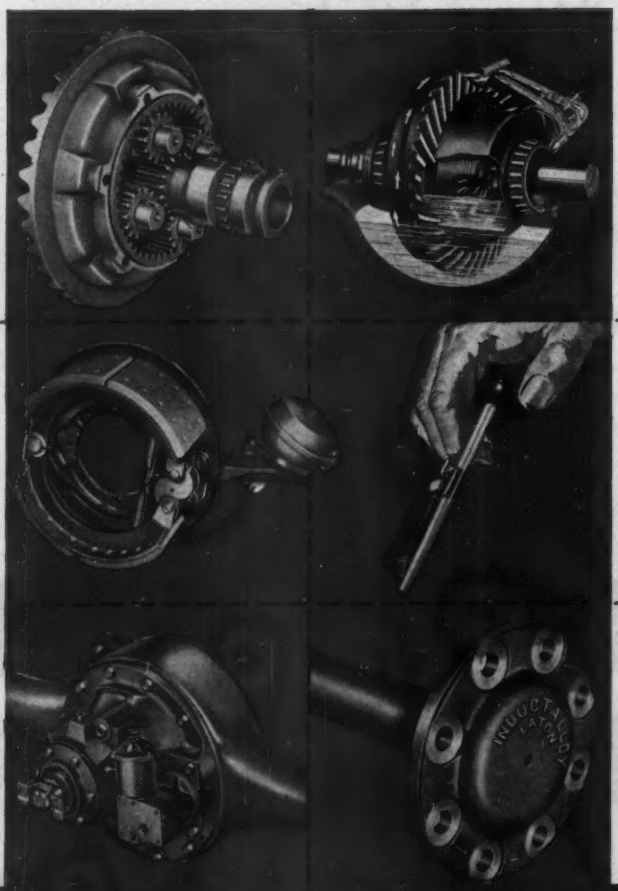
Only Eaton 2-Speed Axles Have these Cost-Saving Features



PLANETARY GEARING

—distributes wear over four rugged, slow-moving planetary gears, resulting in lower unit stress, reduced maintenance, and longer axle life.

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—supplies positive lubrication to all moving axle parts, even at slowest vehicle speeds. Reduces wear; cuts repair bills.

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—makes quicker, safer stops. Simple design with fewer parts cuts relining time. Available on Eaton air brake models.

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—provides quick, easy shifts. Drivers use right ratio for road and load; take full advantage of 2-Speed benefits.

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—of housing and all moving parts eliminates the possibility of harmful distortion or misalignment under full load; holds maintenance to a minimum.

INDUCTALLOY AXLE SHAFTS

—made of alloy steel, with Eaton's exclusive method of dual-hardening truck shafts; last up to 10-times longer; keep trucks on the road.

More Than 2-Million Eaton Axles in Trucks Today

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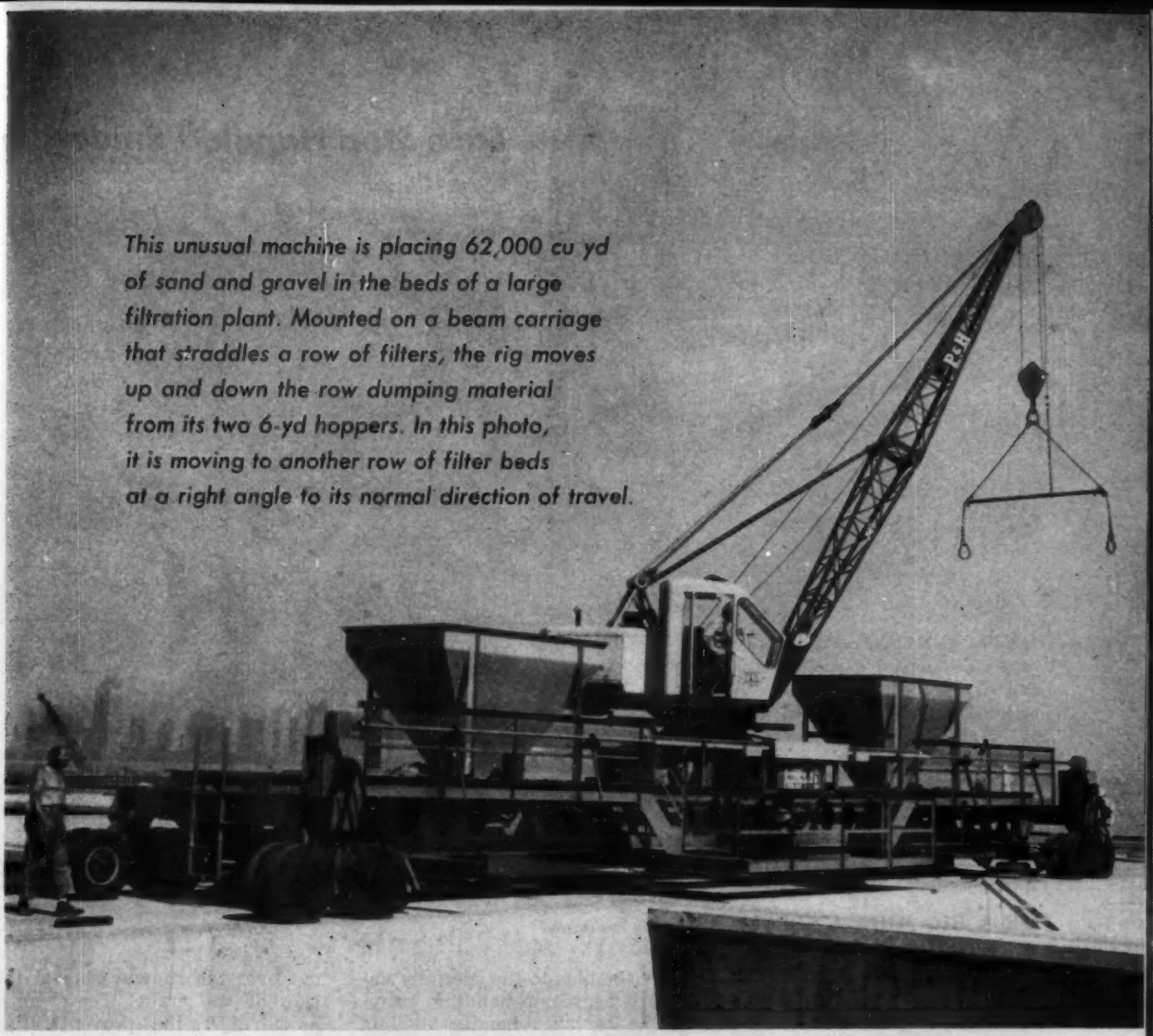


This unusual machine is placing 62,000 cu yd of sand and gravel in the beds of a large filtration plant. Mounted on a beam carriage that straddles a row of filters, the rig moves up and down the row dumping material from its two 6-yd hoppers. In this photo, it is moving to another row of filter beds at a right angle to its normal direction of travel.

For a Big Job—a Special Rig

A SPECIAL CRANE solves a complex materials handling problem for the builder of a water filtration plant in Chicago.

Mounted on a beam carriage that spans 59½ ft, the crane travels along, depositing layers of sand and gravel in a series of 25x71-ft filter beds. The beam carriage rolls on four-wheels at each corner. The wheels ride on 6-ft-wide cantilevered walkways on top of the 695-ft walls of the filter beds. A power-take-off from the original crawler drive of the crane supplies the motive power to the wheels.

The crane lifts bins of sand and gravel from trucks that shuttle back and forth along concrete runways criss-crossing the filters. Then it empties them into two 6-yd hoppers, also mounted on the beam carriage, on either side of the crane. When the hoppers are full, the rig moves along the row to the bed being filled and chutes the material to the bottom, where workmen spread it to the required thickness.

Contractor George D. Hardin, Inc., had the rig built for a $3.2-million contract for placement of 26,000 tons of gravel and 36,000 tons of sand in 96 dual filters at the Chicago Central District Filtration Plant.

Each dual filter consists of two 25x71-ft.beds, side by side. There are eight dual filters in each of the six rows that make up a block. The job includes two 379x695-ft blocks of filters. A 180-ft-wide concrete headhouse containing a low-lift pump station separates the two blocks of filters, which run down the middle of the 61-acre cofferdam-enclosed site jutting out from the Lake Michigan shore.

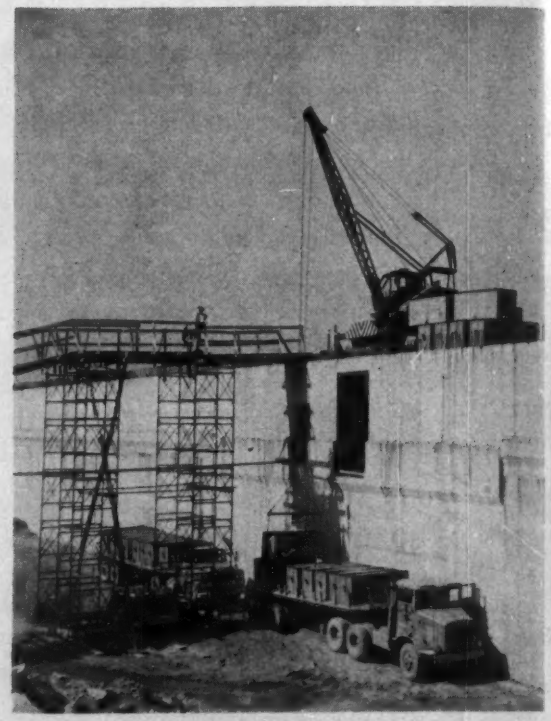
Along the longitudinal centerline of each block of filters, a 22-ft-wide concrete deck slab covering the main pipe gallery forms a runway for trucks delivering aggregate to the beds. Four transverse runways, each 20 ft wide, cut across each block in the other direction.

Seven layers of gravel, varying in thickness from 1½ in. to 4 in., cover cast iron lateral underdrains that collect water at the bottom of the beds. Total depth of the gravel is 20 in. Sizes range from 4 in. at the bottom to about ⅛ in. at the top. A 26-in. layer of sand caps the beds.

continued on next page

Each Step Handled Smoothly

LOAD—At the railroad yard, a Barber-Greene conveyor fills a truckload of eight 2-yd bins with sand or gravel in 10 min. Tractor-trailers haul bins three miles to job.



LIFT—On runway at top of filter wall, Bantam crane lifts bins from tractor-trailer below, reloads them on flat-bed trucks that deliver material to aggregate crane.

FOR A BIG JOB—A SPECIAL RIG . . . *continued*

The sand and gravel is shipped to the job by rail. A Barber-Greene conveyor unloads the gondola cars at a railroad yard and shoots the material into 2-yd bins that tractor-trailer trucks haul to the job site. Each of the three trucks—one GMC, one Chevrolet, and one International—carries eight of the 7x3x2½-ft bins. Full bins weigh about 2½ tons. The contractor has 40 of the welded steel bins on hand.

It takes about 10 min to load a truck-full of bins. As each bin is filled, a workman signals the truck driver to move ahead until the discharge end of the conveyor is in line with the next empty bin. Haul distance from the yard to the job site is about 3 mi.

At the job site, the tractor-trailer pulls up beside a 32-ft-high reinforced concrete wall at the east end of the filter substructure, which was completed last year by another contractor. A Schield Bantam CR-350 self-propelled crane on a runway at the top of the wall transfers the bins from the truck below to one of two Chevrolet flat-bed trucks operating on the runway. These deliver the bins to the specially designed aggregate-handling crane.

The Bantam rehandles all eight bins in about 30 min. First it picks up three loaded bins, one at a time, and puts them on a waiting flat-bed truck. Then it lowers three empty bins to the tractor-trailer while the other flat-bed truck is getting into loading position. After loading three bins on the second truck and again lowering three empty bins, the Bantam crane hoists the two remaining loaded bins to the top and places them on the concrete runway slab for temporary storage until an empty flat-bed is available. Then it lowers the two final empties, and the tractor-trailer is ready for the return trip.

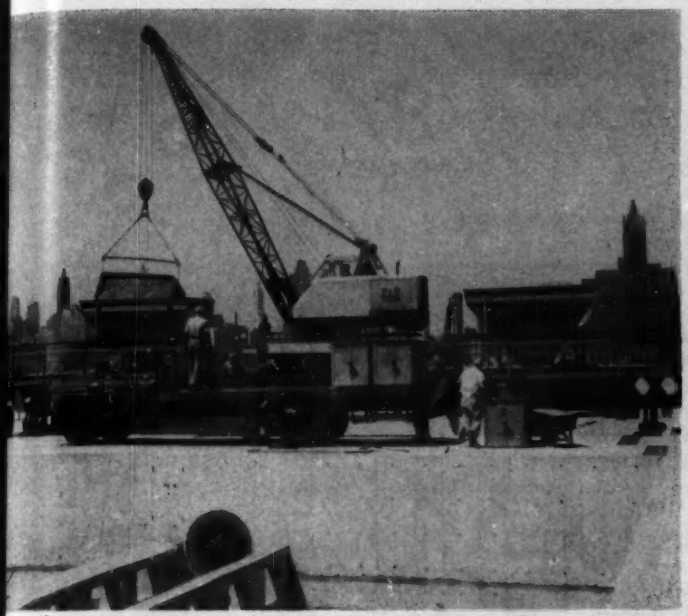
The flat-bed trucks pull in alongside the special aggregate handling crane with their load of three bins, and the crane unloads the bins one at a time. With its whip line, the rig upends a bin to dump its contents into one of the two 6-yd hoppers mounted on the beam carriage.

During loading of the hoppers, a pair of beams fastened underneath the beam carriage projects out over the runway slab at the side of the crane. These serve as outriggers that prevent tilting of the rig when it reaches out to pick up a bin. Maximum crane operating radius is 30 ft; minimum radius is 10 ft.

When the hoppers on the carriage are full, the rig moves down the row of filters to the bed being worked on, riding on T-shaped walls between filter rows. To distribute material, a workman at the bottom opens the discharge gate of a hopper, sending material swirling down a cable-suspended chute. The workman swings the chute, which rotates 180 deg back and forth across the width of the bed. The crane creeps along the length of the bed while the hopper is emptying, distributing material evenly over the entire bed area.

Finally, workmen spread the sand or gravel into a layer of the specified thickness. Rectangular timber frames set on top of the previous layer serve as screed bars that help them rake the material into a layer of uniform depth. A set of five such frames, made up of 2x4s cut to the prop-

om Yard to Job Site



DUMP—Crane dumps bins from flat-bed trucks into the two 6-yd hoppers mounted on the beam carriage that spans 59½ ft across row of filters.

SPREAD—As rig rolls along row, workman at bottom opens discharge gate of hopper, swivels chute back and forth to distribute material evenly.

er depth and held together by carriage bolts, is needed for the job.

Key to the smooth movement of material on the job is, of course, the aggregate-handling crane. Abell-Howe Co., overhead-handling specialists of Forest Park, Ill., built the rig for Hardin. They adapted a P&H Model 155A crane with a 30-ft boom and built the rest of the rig around it.

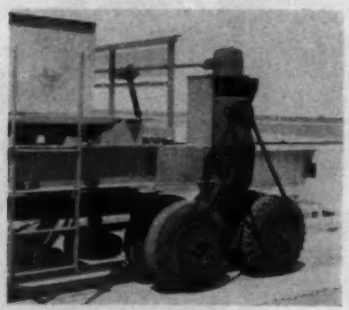
Two parallel 30-in.-deep WF beams 6 ft apart, connected and braced by steel struts, serve as a carriage for the crane. The carriage spans 59½ ft. At each corner of the carriage there are four rubber-tired wheels. On one side, the set of wheels is powered by a drive shaft running along that side of the beam carriage. The set on the other side are idlers. Distance between sets at each end is 12 ft.

The crawler drive of the crane powers the drive bogies. A sprocket and chain power-take-off at the center of the crane drives smaller sprockets mounted on a drive shaft running the

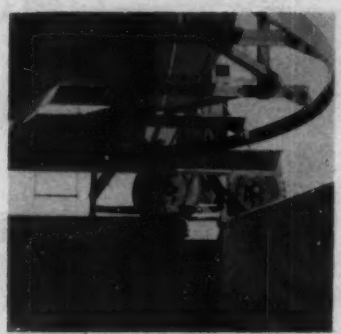
continued on page 178

Here's How Special Rig Works

POWER—Crawler drive of crane turns the drive shaft that powers bogies.



BOGIES—Gear box at each end of the drive shaft transmits power to drive wheels.



KEEPING IN LINE—Guide wheels rolling along top of wall keep rig aligned.

SHIFTING DIRECTION—Jack lifts end of carriage as workmen turn bogies.

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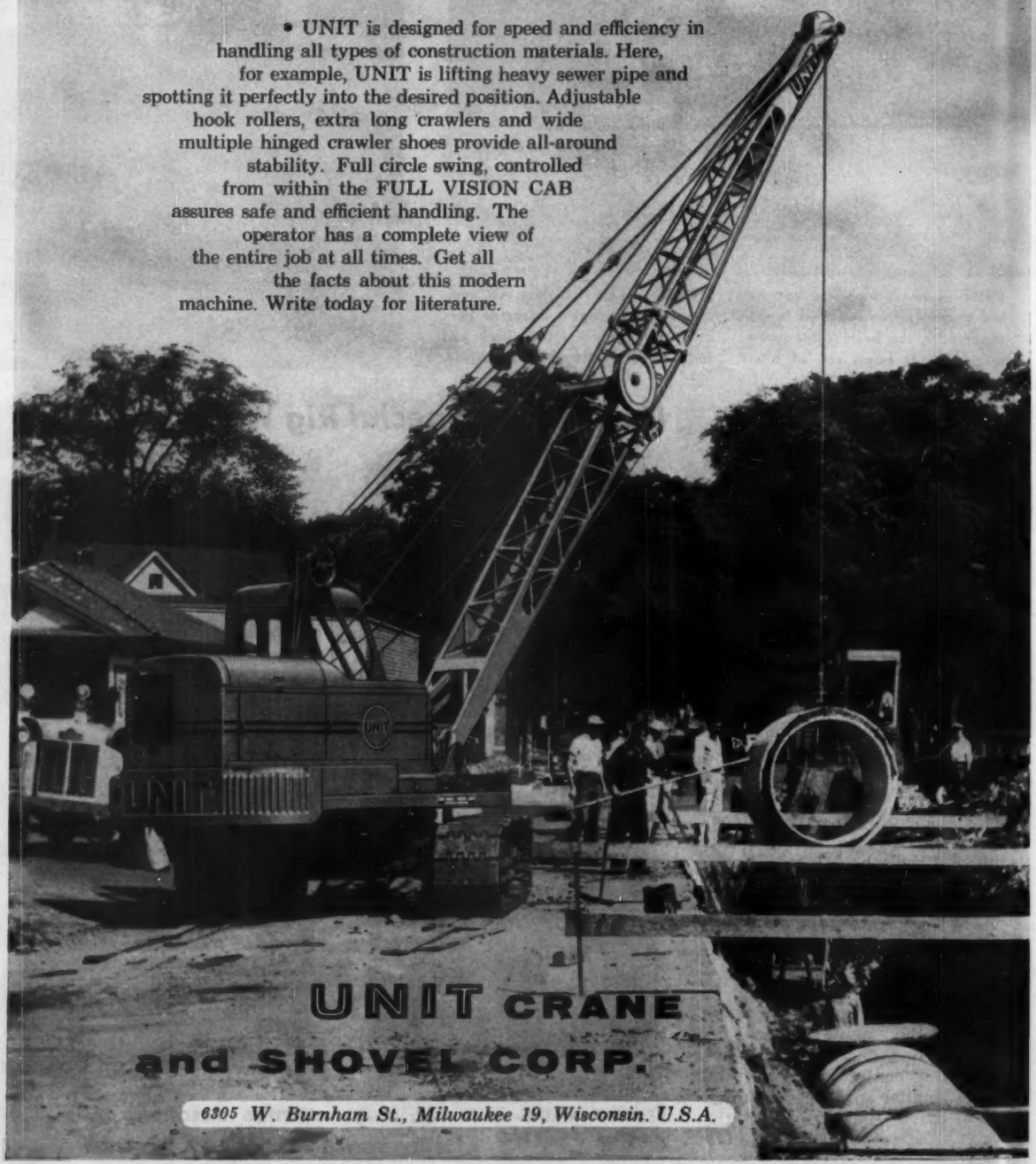

UNIT CRANE and SHOVEL CORP.

6305 W. Burnham St., Milwaukee 19, Wisconsin. U.S.A.

AS-5020

This Cat No. 12 Motor Grader is undercutting banks down 28 inches deep in St. Anthony Village, Minnesota. Cutting both sides, it averages about 8 blocks a 10-hour day in compacted hardpan. Owner: J. A. Denens & Son, Inc., Minneapolis, Minn.

LOOK! THESE IMPROVEMENTS IN THE No. 12 PAY OFF IN EVEN HIGHER PRODUCTION!

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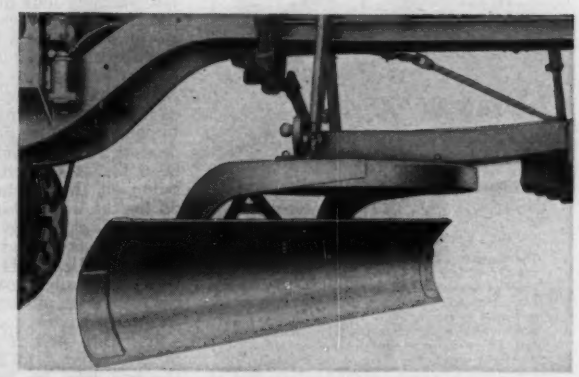
2 Blade thickness has been increased to 7/8 inch and blade beams have been increased in length and thickness to handle heavier loads. Lift arms have been lengthened and links shortened to enable operator to obtain all blade angles more easily. Circle reverse gear housing has been redesigned for better clearance as well as to increase the life of components and make service adjustments easier.

3 There's a new, stronger one-piece case for the transmission and final drive. This eliminates possible leakage at gaskets. In addition, transmission bearings have been strengthened for longer gear life.

4 New mechanical controls for reduced kickback, easier engagement. New power control clutches have two teeth, instead of four, and improved contact angles. They are more positive to engage, easier to hold in position.

5 New blade controls feature a positive mechanical lock—exclusive with Caterpillar. When the control is in neutral, the power shaft is locked by a set of gear teeth to prevent creeping.



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STEP UP PRODUCTION WITH THE IMPROVED No. 12

length of the beam carriage. At the ends of the drive shaft, bevel gear boxes transmit power through cone-drive speed reducers into a sprocket and chain drive at the outside of the drive bogies.

The rig has four selective drive speeds. Normal operating speed (in third gear) is 90 ft per min. Others are 22½, 45, and 185 ft per min.

Horizontal guide wheels that roll along the vertical face of the cantilevered walkway slab near the top of the filter wall keep the rig in alignment. They prevent skewing that might throw the wheels of the bogies over the side of the walkways. The relatively long span of the beam carriage, together with the distance between idler and drive bogies, made this precaution necessary.

Each of the two guide wheels at each end of the beam carriage is mounted on a pipe axle that fits into a sleeve projecting downward from a steel frame bolted to the bottom flange of one of the main carriage beams. The telescoping pipe axle permits vertical movement of the guide wheels so they can be lifted clear of the cross-walls between dual filters.

The mechanism that lifts the guide wheels is automatic. A pair of six-inch hard-rubber rollers—one on each side of a guide wheel—acutates the mechanism. Mounted at the end of a lever arm attached to the mounting frame, the roller strikes the top of a cross-wall as the rig approaches it, swinging backward and up as the lever arm pivots about its center pin, until it rides up over the edge of the wall and rolls along the top.

This motion causes a double reaction. A cable connecting the top of the center-pinned lever arm to the bottom of the telescoping pipe axle pulls the wheel up. At the same time, a strut pinned to the bottom of the lever arm and to the base of the pipe axle pushes the wheel up. Both reactions combine to lift the wheel high enough to clear the cross-wall.

When the wheel is clear on the other side, a spring inside the telescoping pipe axle pushes the guide wheel back down.

The aggregate-handling crane concentrates on one row of filters at a time, bringing up one layer in each bed throughout a row. When all layers in a row are placed, the rig moves on to the next row.

Rig Moves Other Way

Moving the rig across the block of filters from one row to another calls for a 90 deg switch in direction of travel. And that means rotating the bogies.

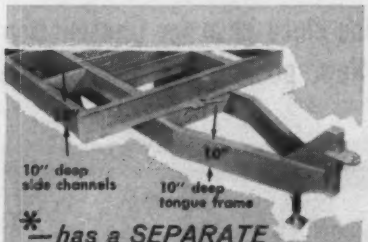
Here's how they do it. A 10-ton Hein-Werner hydraulic jack lifts one end of the beam carriage, and workmen remove the four bolts holding a bogie. Then the crew swivels each bogie 90 deg around its center pin, and re-bolts it. When the same simple switch has been completed at the other end, the rig is all set to move sideways on to the next bay.

The crew recently pulled off such a transfer, covering a distance of 290 ft, in just 30 min. A special locking device holds the horizontal guide wheels that roll

DON'T BE FOOLED
all tilt trailers are NOT alike...

only a MILLER:*—*is so perfectly balanced*

a child can hitch it!



**—has a SEPARATE tongue frame*

The tongue in the OT-15 is not merely suspended from the platform frame (as in many tilt trailers), it's a frame in itself. With a platform pivot point way back near the rear wheels, MILLER provides the lowest possible platform without a "beaver tail" hump.

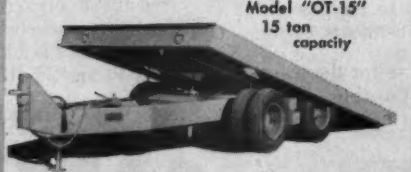
Like beauty, performance is more than skin deep. A lot of tilt trailers may look alike "at a distance" . . . but when you *really compare* . . . on a feature-by-feature basis, you'll find so much more performance-per-dollar in a MILLER Tilt-Top. Look for example, at the amazing unretouched, hitching photo above. The massive OT-15 weighing about 6000 lbs. is so perfectly counterbalanced that it takes only 35 lbs. of lift to hitch the tongue. And look at *all the other advantages*, illustrated at the left, that you get with a MILLER. When buying a trailer *don't be fooled* by price comparisons alone. Compare where it counts . . . and you'll find each of 10 MILLER models from 4 to 22 ton capacity the best buy, by far!

ORDINARY tilt trailers creep or force wheels back on loading

need hazardous beaver tail with unsafe over-the-hump loading

hazardous ridge where control is poor

Model "OT-15" 15 ton capacity



Miller® Tilt-Top Trailer Inc.
457-Z S. 92nd St. Milwaukee 14, Wis.

200 cubic yard-per-hour output of NOBLE job-site batching plant key to largest concrete construction contract

By providing up to 1000 cubic yards per day of quality concrete unobtainable from local sources, a NOBLE job-site batching plant was instrumental in securing the largest concrete job ever let in the Phoenix, Arizona, area — 60,000 cubic yards—for Job Concrete Construction Company, Pomona, California. With the NOBLE plant batching and discharging 4 cubic yards of cement and aggregates in 72 second cycles at the job site, only 10 transit-mix trucks, each hauling an average of 80 cubic yards per day, are required to supply *all* concrete for 2,000,000 square feet of slabs, gutters, sidewalks and foundations on the Luke Air Force Base housing project of 725 homes and for lining a 2½ mile long flood control ditch. With recorder and other automatic controls to meet rigid Corps of Engineers specifications, the plant has a 4-compartment 150 ton capacity overhead aggregate bin and a separate 500 barrel capacity overhead cement silo. A second overhead cement silo can be added using the existing 350 barrel-per-hour vertical cement elevating screw.

NOBLE

All NOBLE batching plants with overhead aggregate storage capacities ranging from 100 to 500 tons or more feature big savings from fastest erection. NOBLE requires no outside purchase of essential components or extensive field assembly and wiring. These normally out-of-pocket expenses with conventional plants are included in the price of NOBLE and may become a part of long-term equipment financing. Available cash is thereby released for current expenditures.

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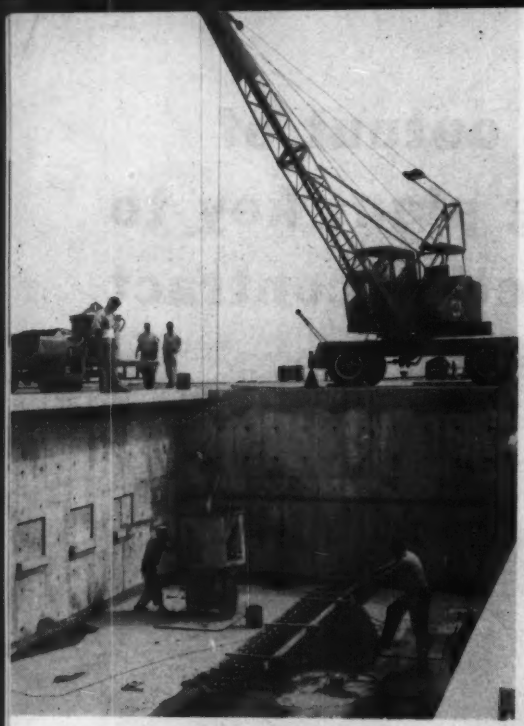
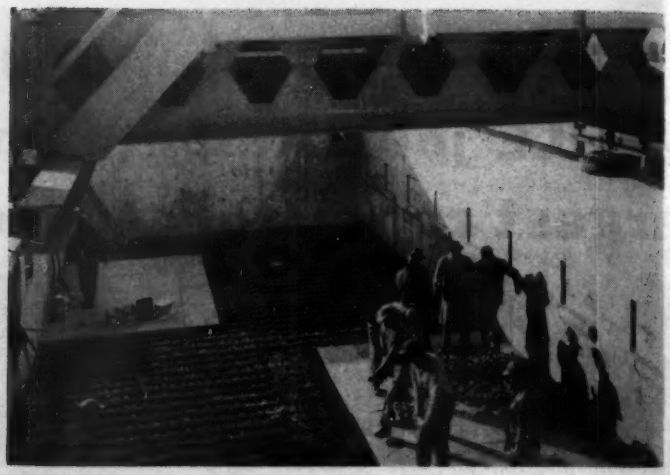


FIRST STEP—Bantam crane handles concrete bucket that feeds Georgia buggies used in pouring manifold slab around cast iron tees at center of a 25x71-ft filter bed.



FIRST LAYER—Workmen spread layer of 4-in. gravel around cast iron laterals that will collect water at the bottom of the bed.

FIRST METHOD—Crane orginally dumped bins directly into beds. Addition of hoppers to carriage eliminated rehandling of bins.

Early Work Takes Longer and Requires More Hand Labor

FOR A BIG JOB . . . ***continued***

along the face of the walkway slab in the up position during the move.

Preliminary Work

Before placing the layers of sand and gravel in the filter beds, the contractor has to place 4-in. cast iron manifold tees at the center of each bed and encase them in concrete. A Schield Bantam crane handles both chores. It lowers the tees to the floor slab at the bottom of the beds, then handles a concrete bucket that feeds the Georgia buggies.

The Bantam crane also places 4-in. cast iron lateral underdrains on the concrete floor of the beds. With the underdrains in place on their concrete supports, the bed is ready for the first layer of gravel.

Hardin didn't work out their clever scheme of aggregate placement all in one stroke. At first, without distributing hoppers mounted on the beam carriage, the crane dumped the 2-yd bins directly into the filter beds. It lifted the bins from the flat-bed trucks and loaded them on the beam carriage. Then the rig had to rehandle each bin individually when it reached unloading position. Addition of the two hoppers eliminated time-consuming rehandling of bins by the crane and materially speeded up production.

Hardin originally planned to use two of the aggregate-handling rigs on the job—one for each block of filters. But the first one is working out so well that now they don't think they'll need another. When all beds in the east block of filters (where the crane is now working) are full, the contractor will dismantle the rig, move it piece by piece over to the west block, and put it back together to polish off that section.

So far the rig is averaging about 350 yd of material put in place per day. Despite a late start, the contractor expects to complete the work in another six months, well ahead of schedule.

Though designed especially for placing aggregate, the crane also handles another operation. When the filter beds in a row are full, it places precast concrete wash water troughs that feed water into the top of the beds.

Men on the Job.

General superintendent Walter McCall heads the job for Hardin. Project engineer is William Goodoff. Superintendent Al Chamness heads the field crew. His brother, William Chamness, is foreman in charge of the aggregate placement operation. Engineer in charge for the City of Chicago is Arnie Anderson.

Top man on the Abell-Howe design team that drew up plans for the aggregate handling crane is William F. Schlex.

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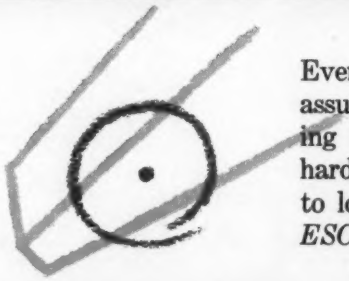

Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

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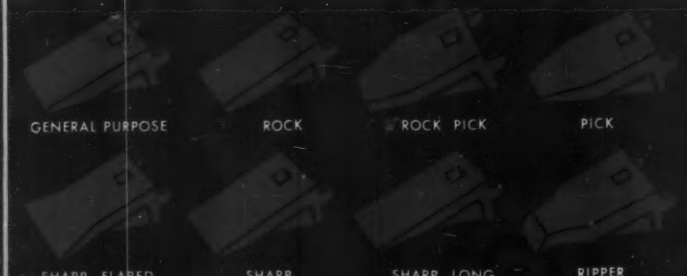

ESCO Point shapes . . . start sharp, stay sharp and last longer under any digging condition.

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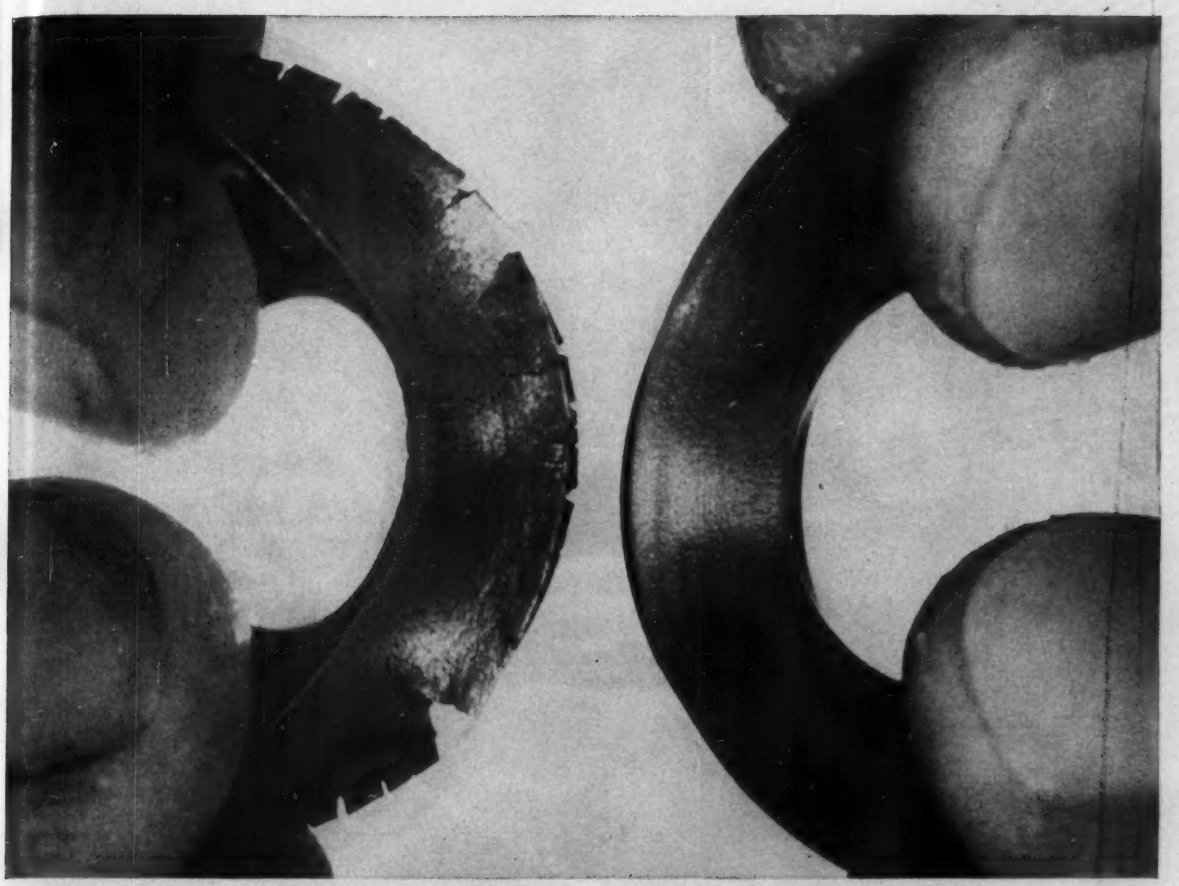

Two torque converter seals, subjected to 300 hours of service at 325° F., show added protection of D-A Torque Fluid. Seal on left, used with ordinary torque fluid, is brittle and cracked, has shrunk excessively. Seal on right, used with D-A Torque Fluid, remains resilient and reveals no cracks or deterioration. It was protected by D-A's *exclusive* preservative.

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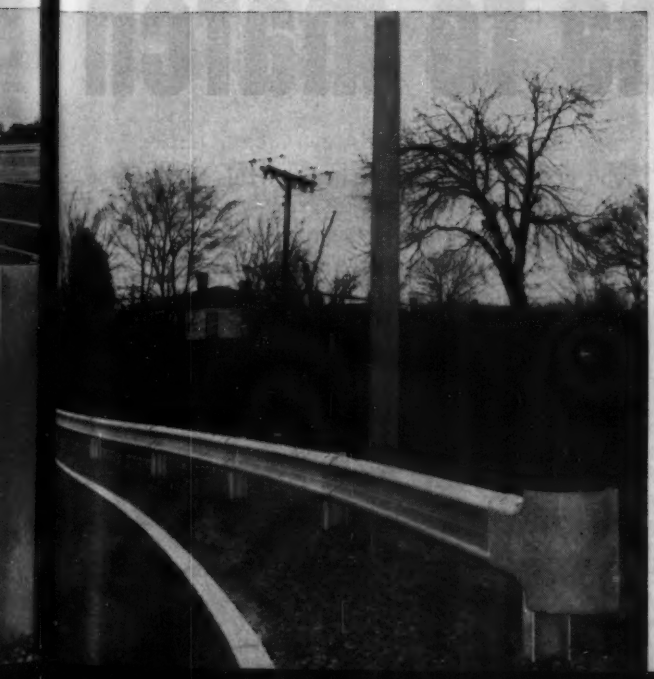

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1. *All* mill scale is removed before the guard rail section is formed, assuring uniform, tenacious paint adherence.

2. Prior to painting, all sections are degreased, given two hot water rinses, and oven dried. Then a coat of rust-inhibiting shop primer is applied.

3. USS AmBridge Beam Guard Rail can be furnished in 25′ lengths, cutting splicing requirements in half and appreciably reducing bolt costs.

For more information, get in touch with any of the offices listed below. *USS is a registered trademark*

New Movie Available—

"Challenge at Carquinez—Project 56-14," an interesting sound and color 16mm film. Showing time, 25 minutes. For free booking, write to Pittsburgh, Pa.

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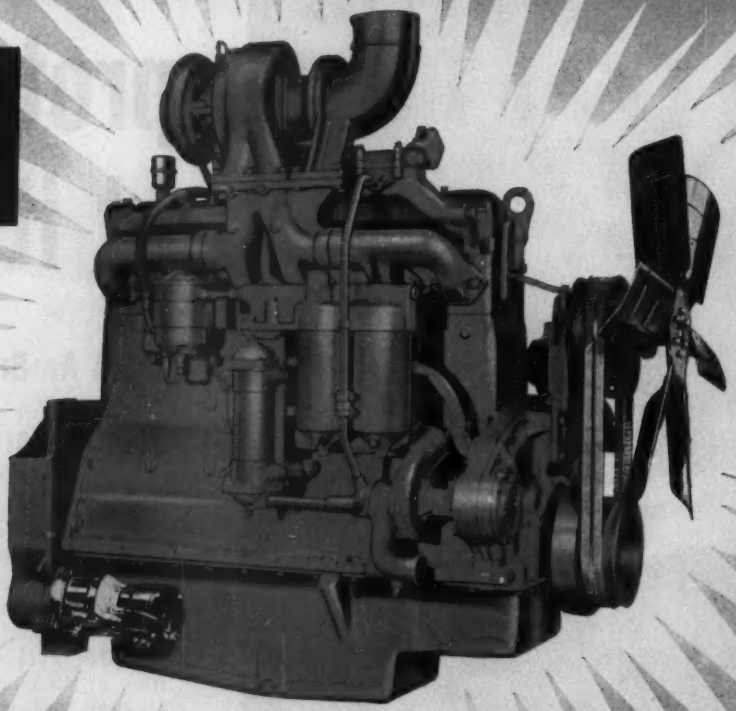
Most economical diesel of its kind



The new Allis-Chalmers 21000 saves up to 3 gallons of fuel in every 10, compared with other diesels.

...has stamina to match

Here's the heavy-duty engine that was tested under full load with half the connecting rod and main bearings cut away. It was deliberately run hot and with only partial lubrication. It was operated with intentionally weakened parts and with imbalances. Its stamina was tested far beyond toughest field use to prove that its great economy was more than matched with ability to take it. Hundreds of field reports show the difference between this great engine and ordinary diesels!

The Allis-Chalmers 21000 and the companion 16000 (naturally aspirated) engines run clean, run longer, because of superior, advanced engineering. Get the story of this modern cost-saving power from your dealer. Allis-Chalmers, Milwaukee 1, Wisconsin.

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***POWER* FOR A GROWING WORLD**

BE-17

Two 60-ton cranes move one end of girder from railroad flat cars to first lowboy.

Threading a 187-Ton Girder Through Busy City Streets

TO ERECT a 187-ton steel girder, an American Bridge crew had to maneuver it through narrow city streets and then thread it under a railroad bridge. The 13x126-ft section is a key member in the three-level Kinzie-Hubbard Street overpass of Chicago's Northwest Expressway.

Three railroad flat cars took the girder from Ambridge, Pa., to a siding seven blocks from the job site. There, two 60-ton Manitowoc cranes, working jointly to lift one end of the girder at a time, mounted it on two lowboys that faced in opposite directions.

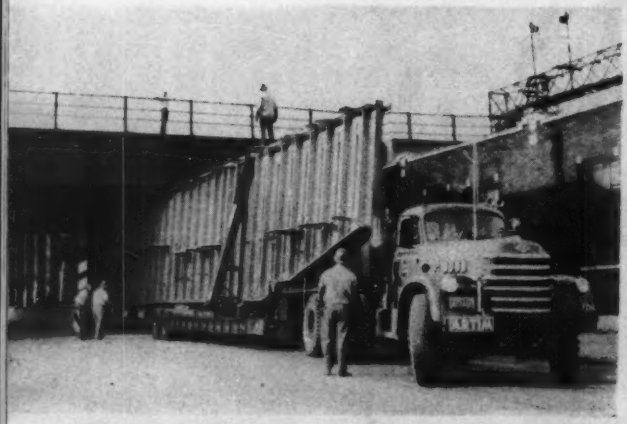
As one tractor moved forward with one end of the girder, the tractor carrying the other end moved in reverse. In this manner the two rigs eased the girder around corners to the middle deck of the three-level interchange.

Working from this middle deck, American Bridge transferred the girder from the lowboys to a temporary 200-ft railroad trestle that passed under a permanent Chicago & North Western railroad bridge. With the lowboy parked alongside the end of the trestle, a newly introduced 125-ton crane—the Manitowoc 4000—mounted the leading end of the girder on a 100-ton dolly that rode the trestle tracks. As the girder rolled ahead, the second lowboy, still backing, moved into the position vacated by the first lowboy. Winches pulled the dollies at a crawl pace to the other end of the trestle near the reinforced concrete piers.

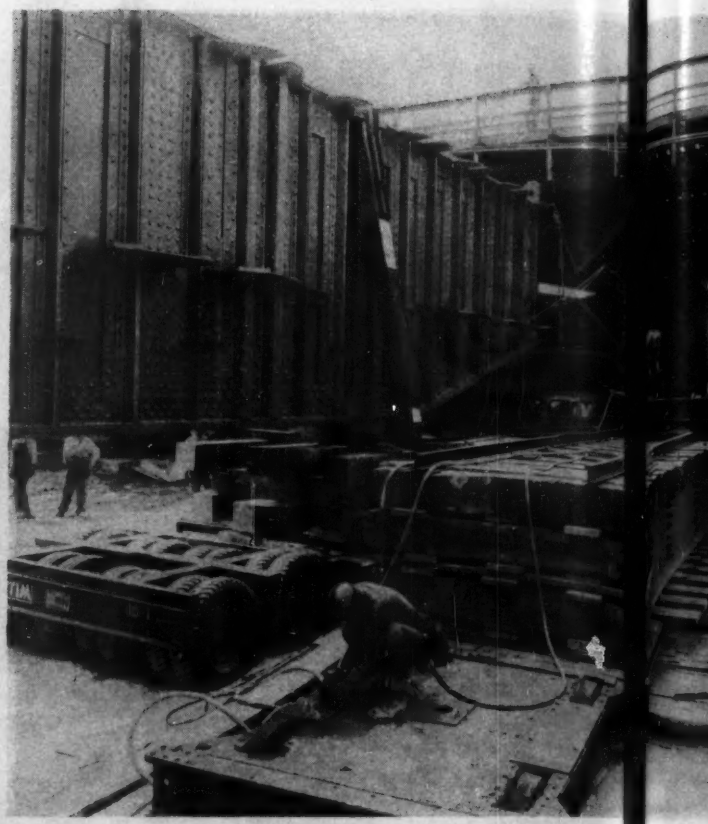
The crane, boom lowered, moved down a ramp and under the bridge, to a new hoisting position at ground level. There it picked up the leading end again and placed it on top of a 17½-ton steel seat. Then the crane moved back to pick up the rear end of the girder and place it on a 14½-ton rocker seat, designed to expand and contract with temperature changes.

continued on next page

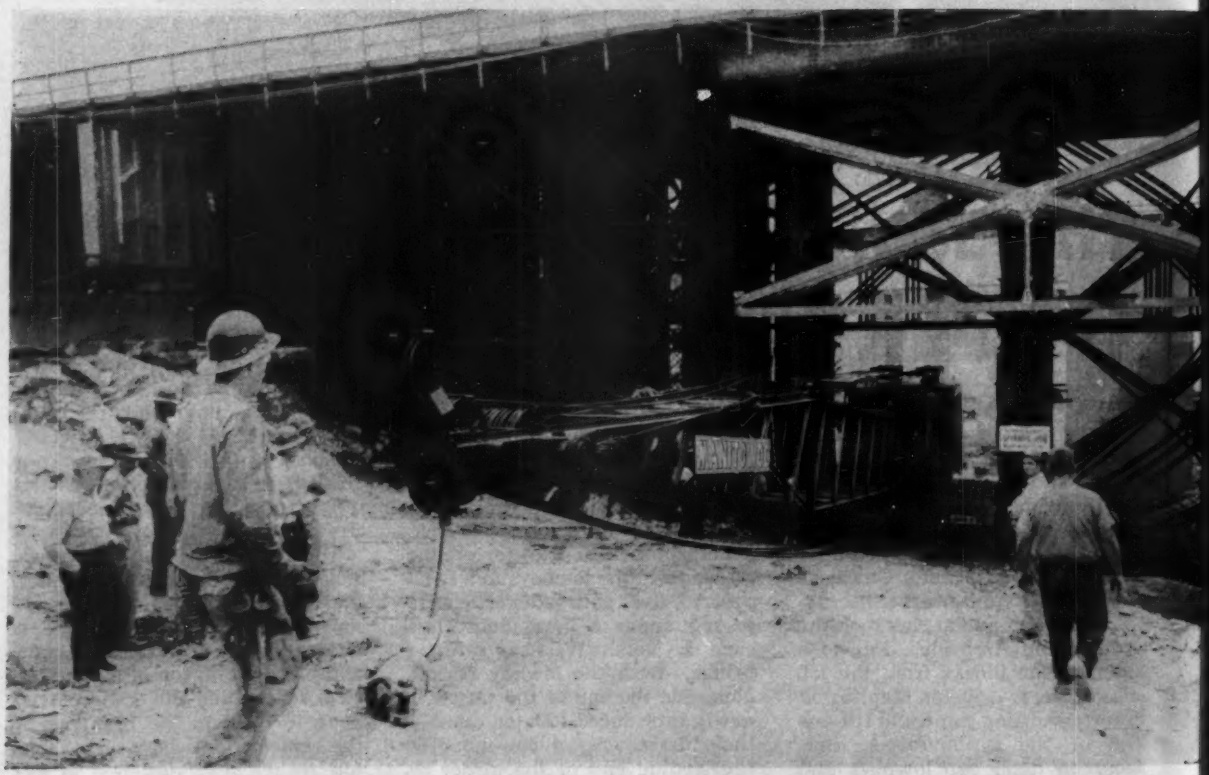
Mounted on Dollies, Girder Rides on Trestle To Concrete Piers



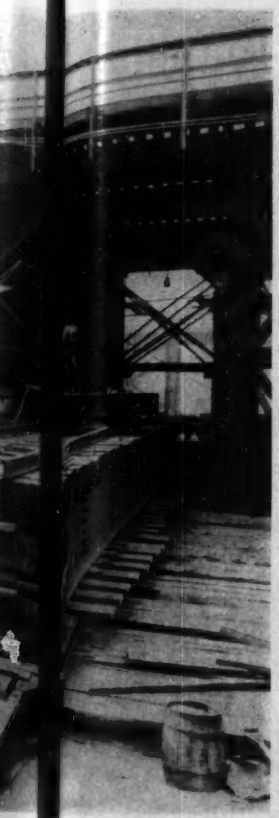
Girder squeezes through underpass with 2 in. headroom to spare.

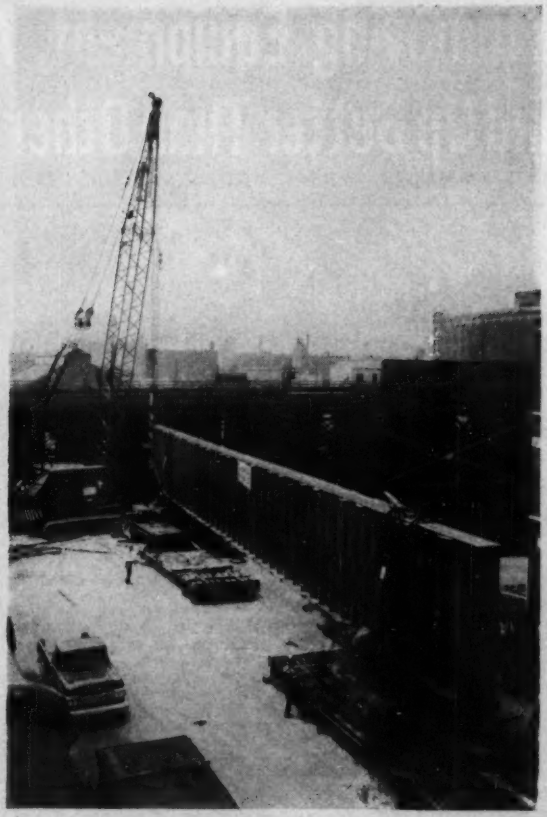


Workers prepare to move one end of girder onto dolly at end of trestle.

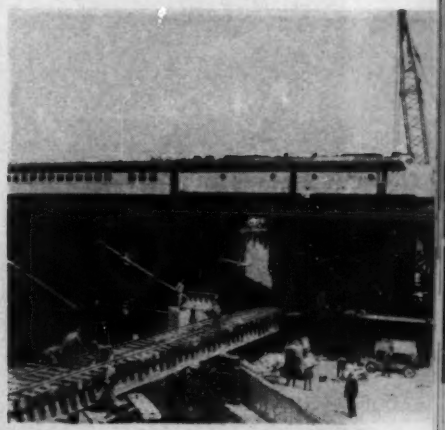


With its boom horizontal, crane crawls under bridge to erect girder.

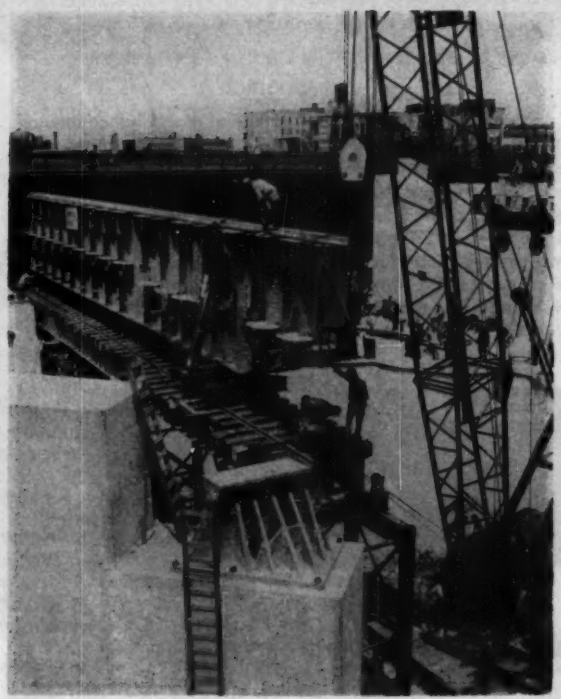




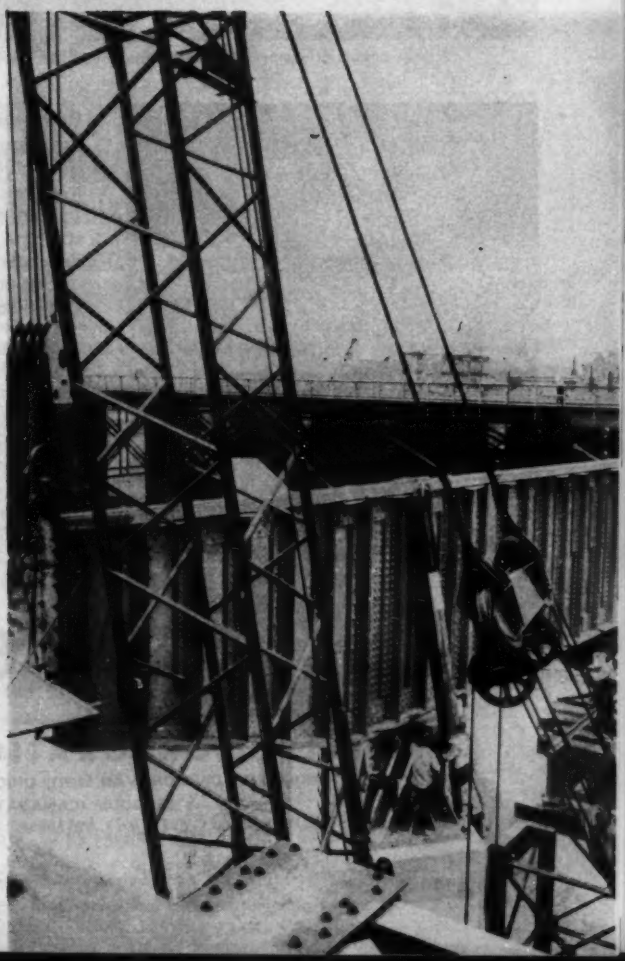
New 125-ton Manitowoc swings leading end of girder onto first dolly.



Girder emerges under railroad bridge, pulled by winches.



Girder at end of trestle lies opposite pier. Crane picks it up and places it on 17½-ton steel seat.



"On Heavy Earthmoving Equipment, Aeroquip Hose Lines Stand Up Better Than Other Makes"

A large amount of equipment at the Warrior River dam site is serviced by a small stock of Aeroquip Bulk Hose and Reusable Fittings.

Aeroquip Hose and Reusable Fittings are assembled on the spot to keep equipment downtime to the minimum.

Dependable Aeroquip Hose Lines are first choice of maintenance men on large projects like Alabama Power Company's Lewis Smith Dam.

"I've never found a better hose than Aeroquip for replacement hydraulic lines," reports Parts Manager Hunt.

Another Aeroquip advantage—hose lines for all makes of tractors, scrapers and dumps used on this job are made up quickly, as they are needed, from Aeroquip Bulk Hose and Reusable Fittings.

Get the full money-saving Aeroquip story from your nearby Aeroquip Distributor. He's listed in your Yellow Page Directory.

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LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

CUT YOUR LOADING COSTS WITH NEW 5 Yd. LIMA LOADER

5 MACHINES IN 1!
converts in field to shovel, crane, dragline or pullshovel

FLEXIBLE!
digs, scoops, swings and loads in full circle

ELIMINATES WASTE MOTION

CUTS WIDE 8-Ft. SWATH

NEW LIMA UNIT GIVES TOP LOADER PRODUCTION WITH SHOVEL EFFICIENCY... serves as excavator, materials handler

The new Lima Loader, with giant 5-yd. bucket, moves more dirt and materials faster and more profitably.

These are the reasons — long horizontal crowding action; big 5-yd. capacity bucket; full swing versatility; high-speed digging and loading from stationary position.

NO WASTE MOTION

Powerful 9-ft., 10-in. horizontal crowding action assures maximum loading at every 5-yd. bite . . . even when handling wet materials. Bucket is completely filled without moving machine; results in less travel wear, lower maintenance and fuel consumption.

For maximum versatility, the Lima Loader is mounted on basic Lima 64 crawler type machine. It operates at top efficiency, hour after hour, from a stationary position, no time-wasting maneuvering with each load. Unexcelled full-swing digging and loading at any point of the compass means high production . . . higher profits!

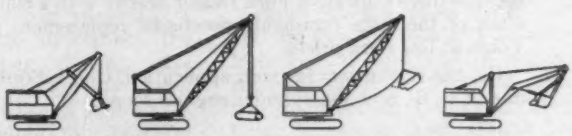
Actually the Lima Loader is 5 machines in 1. It can be speedily converted in the field to a 1¼ or 1½-yd. *shovel*, 40 or 50-ton *crane*, 1¼ or 1½-yd. *pullshovel*, or variable capacity *dragline*.

Other important operational features of the Type 64 Lima Loader include hydraulically controlled bucket which raises to 25-ft., 6-in., permitting 16-ft., 10-in. clear dumping height at 18-ft. radius. The bucket tilts to 52 degrees for complete emptying. 8-ft. wide bucket, with removable teeth, cuts accurately and evenly on sloping banks as well as level ground. Independent travel, optional equipment, but recommended with loader. Torque converter matches power to digging resistance; eliminates engine stalling.

PRECISION AIR-CONTROLLED

The main and auxiliary machinery is precision air-controlled for amazingly easy operation without fatigue.

See your nearest Lima distributor today or write Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, for full information on the 5-yd. Lima Loader — the newest addition to Lima's famous line of high-quality construction equipment.



Shovels to 6-yd. Cranes to 110-tons Draglines, variable Pullshovels to 2½-yd.

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON 5956

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

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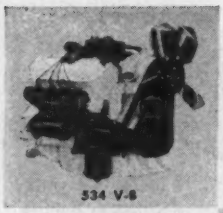
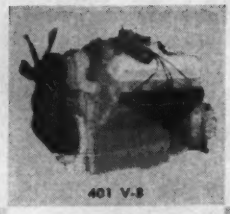

534 V-8

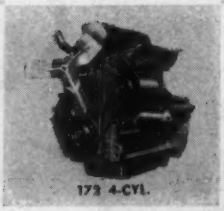
477 V-8

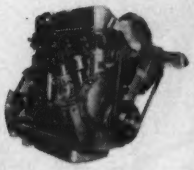

401 V-8

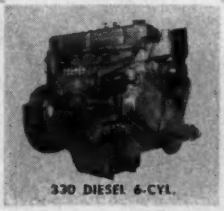
332 V-8

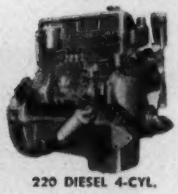
272 V-8

223 6-CYL.

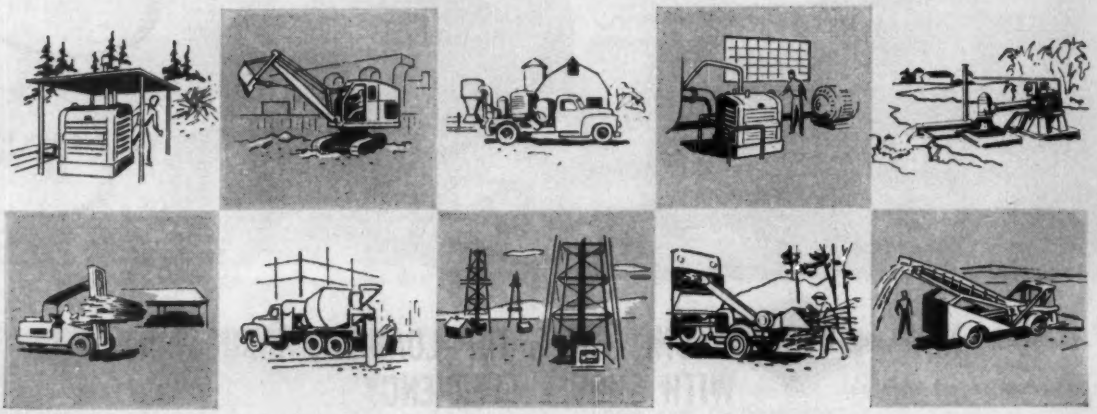

172 4-CYL.


134 4-CYL.


330 DIESEL 6-CYL.


220 DIESEL 4-CYL.

NOW...TEN FORD INDUSTRIAL ENGINES TO MEET YOUR POWER NEEDS!



Whatever your application, consider the many advantages you get with a Ford Industrial Engine.

Completely modern throughout, all Ford engines have Short Stroke design for increased operating economy . . . overhead-valve construction for quick, easy servicing . . . and provide more horsepower per pound of engine weight than ever before possible. To cut costs on *big* jobs, Ford offers 3 new Super Heavy Duty V-8's with totally new lubrication-, cooling-, and fuel-systems.

Ford Industrial Engines range from 134 to 534 cubic inches . . . including two Diesels. All are available as engine assemblies or power units, and can be fitted with Ford-approved attachments such as SAE housings, torque converters, transmissions and other equipment for special operating needs.

What's more, Ford users enjoy a minimum of downtime because there's always a Ford Dealer nearby with a complete stock of the more commonly purchased replacement parts. Yours at low Ford prices.

Get the *right* power for your application. Check Ford's full line of 4-, 6-, and V-8-cylinder engines soon.

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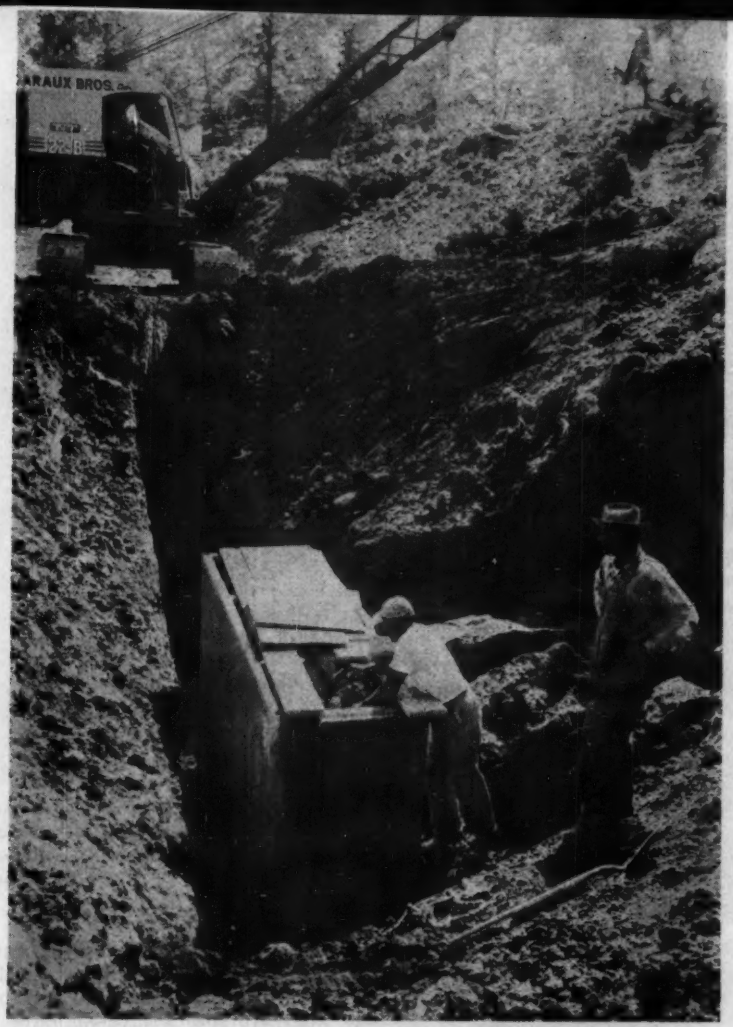

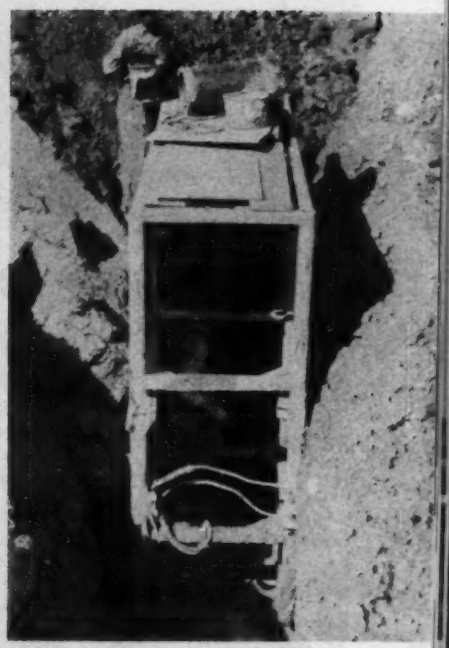

IN THE TRENCH—Cage made of ¼-in. steel side plates connected by a pipe frame shields workmen inside from dangerous slides along treacherous sandy stretch.

This contractor is making safety pay on a pipeline job in Ohio. A steel cage protects workmen laying pipe in the trench, replacing a timber shoring system.

Safety Cage Pays Its Way

SAFETY and high production go hand in hand, finds a pipeline contractor who devised a steel cage to protect workmen in the trench. The cage guards workmen against being buried alive by cave-ins or slides. It also eliminates costly bracing and sheeting.

The cage consists of two ¼-in. steel side plates connected and braced by 3-in. steel pipe framing members. The dragline or backhoe excavating the trench pulls the cage along behind it at the bottom of the trench. The pipelaying crew works in complete safety inside the cage. A bulldozer follows behind, backfilling the trench as soon as the pipe is laid.

Garaux Brothers Co., Canton, Ohio, first used the cage for a job calling for installation of a clay pipe sewerage system in a new residential development in Canton. Before trying it out, they had to use thousands of feet of heavy timber for shoring a treacherous stretch of trench in wet gravel and sand.

Then Ralph H. Green, safety representative of the Industrial Commission of Ohio, suggested a steel safety cage to replace the expensive timber shoring system. His organization has been encouraging the use of such cages to reduce accidents in pipeline work for several years, and more than one contractor in the area has found that following their advice pays off.

One of Garaux's superintendents, C. C. Denning, designed and supervised construction of the cage. His plans called for a taper both from front to rear and from top to bottom to make it easier to slide the cage along the bottom of the trench. He added a steel plate cover to the cage top and a rear door that hooks over the frame.

How did the cage work out? On the first day, only 2 hr after they put it into use, a serious cave-in occurred, trapping three workmen inside the cage. They tired to escape, and almost got buried by a second slide at the rear.

That taught them a lesson. From then on they sat tight in-

OWEN BUCKETS

new center line reeving doubles cable life

"Our new OWEN Bucket is great. That new center line reeving more than doubles our cable life," says Kenneth Muster, Supt. for R. F. Muntz, owner of the Hugo Sand and Gravel Co. of Kent, Ohio.

The tandem positioning of the lower closing sheaves permits the closing line lead to pass directly through the center of the head of the bucket. This exclusive OWEN feature eliminates excessive bending of the cable, resulting in increased cable life experienced by Hugo Sand and Gravel. It also permits the bucket to hang plumb from the crane boom.

This OWEN Clamshell, with all moving parts lubricated . . . with all arm and sheave pins, plus the main shaft, having triple lip grease seals . . . has heavily cut the high maintenance expense of handling this sand suspended in water that comes directly from the wash plant.

"Our operation is tough on a clamshell, but all these improved OWEN features have greatly reduced our maintenance costs and cut down-time," claims Mr. Muster.

Send us your requirements.
OWEN Engineers are at your service at all times.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
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OTHER TYPE—Brand-new second model of safety cage, designed to be lowered by crane into trenches crossing paved streets, provides plenty of room for workmen.

side the cage whenever a cave-in covered it, waiting for fellow workmen up on top to dig them out. Numerous cave-ins have occurred, but no injury to workmen has resulted.

Adding to the versatility of the safety cage is the fact that extra sections can be added, pyramided one on top of another, as trenching reaches greater depth. The cage also is designed to expand, both in length and width, to suit conditions. To take care of larger diameter sewer pipe, telescoping sleeves in the pipe frames connecting the sides of the cage can be extended.

Happy with their first cage, Garaux wasn't satisfied until they had another, specifically suited for a special condition. They built a similar cage, this one with an open top, to be lowered vertically into narrow trenches crossing paved streets. It comes in handy whenever obstructions block the trench and make it impossible to slide the other cage along.

Unlike bracing and sheeting, the steel safety cages are not a one-shot proposition. They can be used on job after job. They may not always replace shoring, but they've proved their value on many pipeline jobs.

GALION® 12-Ton Pneumatic-Tire Roller

NEW NEW NEW NEW NEW

2239

Only Galion offers EQUA-MATIC front end construction

Through the automatic balancing action of three king pins, safe roller support is always assured when working over uneven or sloping ground. Galion's exclusive EQUA-MATIC design provides an equalizing movement straight up and down of all five steering wheels, and an oscillating up and down movement of the end wheel pairs. Thus, firm compacting contact is maintained with the surface at all times by the five wheels.

plus 18 other important features

- ROLL-O-MATIC or standard gear shift drive.
- SYNCHRO-MESH transmission.
- UNITIZED assembly provides easy access and servicing.
- AUTOMOTIVE-type hydraulic steering.
- LARGEST ballastable capacity in relation to overall size—in excess of 24,000 lbs. total weight with wet sand ballast.
- EIGHTY horsepower gasoline engine.
- HEAVIEST construction—8,400 lbs. metal weight.
- LOW center of gravity.
- 100% COVERAGE—treads of the nine tires overlap.
- WIDE RANGE of speeds—same range forward and reverse.
- SHORT drive shaft.
- DOUBLE drive chains to each pair of drive wheels.
- FOUR-WHEEL hydraulic service brake and independent parking brake.
- EXCELLENT visibility for operator.
- SHORT turning radius.
- FOUR large doors for ballast removal.
- SWIVEL seat, fully adjustable.

THE GALION IRON WORKS & MFG. CO.
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GREATER STABILITY

Maximum stability and support across the entire front end of the roller is achieved by GALION'S three-point king pin suspension of the five steering wheels. PATENT PENDING.

SYNCHRONIZED 5-WHEEL STEERING

Each of the five steering wheels is adjusted to always steer in its own true arc. This design eliminates the pushing and gouging of material which results when no provision is made to compensate for arcing variations in multiple-wheel steering.

EASY SERVICING

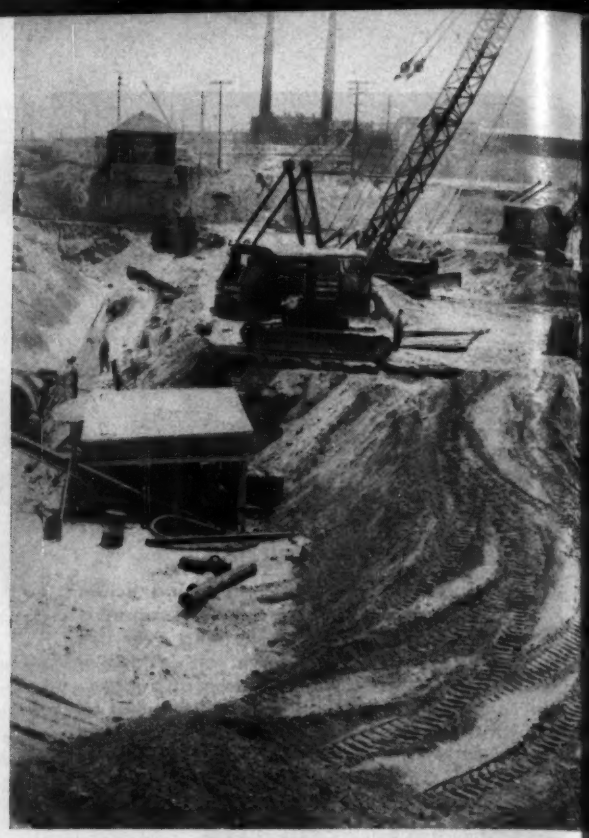
Unitized assembly permits each wheel and wheel brake to be serviced individually, as well as the oil-tight double drive chains. The entire power train can be removed as a unit.

Write for literature.

GALION® ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

How Berke Moore Company builds $4 million of America's bridges, tunnels, and dams in a year



Sewage Treatment Head Works — located at Chelsea, Mass. $2.7 million contract required 90,000 yds of excavation, 15,000 yds of concrete, 1,000 of reinforcing steel.

Contractors continue to play the lead role in the construction industry's growth. There are 3559 million-dollar and over contractors, who account for 83% of the total contracts awarded to firms doing $100,000 and over in 1958.

One contractor among the million dollar group is Berke Moore Company, Inc. of Boston, Massachusetts. This contracting firm was founded in 1941 by Steven R Berke and Raymond L. Moore for the purpose of general contracting and construction engineering. Prior to founding their own company, these men had long and successful experience on the construction of bridges, buildings, roads, dams, tunnels and other construction projects. Mr. Berke and Mr. Moore worked for one of New England's largest construction firms as chief engineer and superintendent respectively.

The long and proven experience of these men has accounted for their firm's growth and success since its founding. Although Berke Moore Co. has engaged in a wide variety of construction, in recent years it has concentrated on bridges, tunnels, underpasses, foundation and dam work. Most of this work is performed in New England, but primarily in Massachusetts and Connecticut.

$20 million of construction in 5 years

One measure of the success of this contracting firm is the volume of work it has attained over a period of years. Contractor Berke Moore has completed approximately $20 million of construction over a five year period . . . an average of $4 million a year.

The nucleus of the Berke Moore contracting operation consists of a permanent staff of 25 key men. These key men are backed up by a force of up to 150 men when the firm is at the height of construction operations.

Berke Moore tackles unusual, tough jobs

While many contracting firms are reluctant to contract for the unusual or especially tough construction projects, Berke Moore pride themselves on taking these projects. Consequently, this contractor has developed many new and improved methods of construction in bridge, dam, foundation and tunnel work. Berke Moore's willingness to tackle the tough projects has been a contributing factor in their success over the years.

Employs variety of equipment

How much and what kind of equipment does a $4 million a year builder of bridges, dams and tunnels and foundations need? According to Mr. Berke, President, their operation requires the use of some one hundred units of major equipment. The total estimated value of this equipment is $750,000.

This contractor, like most contractors who keep equipment operating as regularly as possible, must keep investing in new and better machinery for replacement purposes in order to bid successfully on new jobs. In 1957, Berke Moore invested $100,000 for new machinery and in 1958, $200,000.

Here is a breakdown of this contractor's major units of equipment.

2 truck cranes — (Lorain)
5 crawler cranes — (Manitowoc)
2 shovel and crane — (Lima)
2 graders — (Austin-Western, Caterpillar)
2 Gradalls
1 roller — (Galion)
4 dozers — (International)
1 pile hammer — (McKiernan-Terry)
4 dump trucks — (International Harvester)
1 boiler, 60 hp
3 lighting plants — (Kohler)
7 pickup trucks — (Ford, International, GMC)
6 compressors — (Jaeger)
15 pumps — (Jaeger, Gorman-Rupp)
1 front end loader — (International Drot)
4 welders — (Hobart)
10 vibrators — (Homelite)
30 miscellaneous units of equipment

50% of Gross Invested in Materials

Contractors who do heavy construction work of the type which Berke Moore tackles have a significant investment in materials. This contractor invests an average of 50% of his gross construction contracts in materials such as steel, concrete, lumber, steel sheeting, steel piles, etc. According to Mr. Berke, the success of a project in terms of profit that is made weighs heavily on the purchase of materials as well as the efficient use of equipment.

Here's what Mr. Berke, President, says about purchasing at Berke Moore:

"Because of the large investments which Berke Moore makes annually in construction machinery and materials, we must get the opinions and recommendations of our key men. These include superintendents, project managers, and equipment operators. It's our practice to talk to these men to find out their experience and recommendations on different equipment and materials . . . and to see if there is agreement with the opinions of myself and Mr. Moore. The men who use equipment should know it best. This system helps us to make smarter buying decisions."

Berke Moore, like other successful contractors who invest significant amounts of money each year for equipment and material have key men who exert some influence on purchases. It's for this reason that key men in construction look to the editorial and advertising pages of CONSTRUCTION METHODS Magazine for information on new and better equipment, materials and techniques.

Important men in construction subscribe to CONSTRUCTION METHODS

In addition to Mr. Berke and Moore, there are 6 key men in this important contracting firm who subscribe to CONSTRUCTION METHODS Magazine.

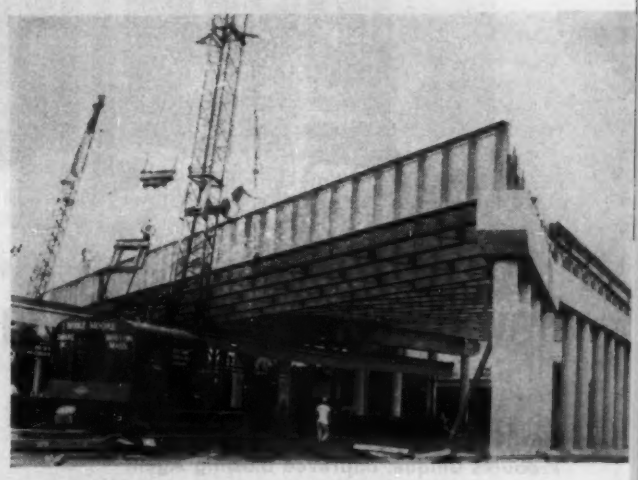
If you want to reach these key men in the nation's top contracting firms like Berke Moore Company of Boston, consistent advertising in CONSTRUCTION METHODS is your most direct route.

Steven R. Berke (left) and Raymond L. Moore, founders and partners of Berke Moore Construction Company, Inc.

Both are long-time readers of CONSTRUCTION METHODS Magazine.

Mr. Berke says:

"I think CONSTRUCTION METHODS is an excellent magazine. I've been reading it for over 30 years. It provides good coverage of important jobs which have given us helpful ideas and techniques. We've applied these in our work through the years. I also think the advertising shows a lot of good techniques, and new equipment, and I make a practice of reading it."



Central Artery of Fitzgerald Expressway. $6½ million bridge project requiring 5,000 tons of steel, 21,000 yds of concrete, reinforcing steel — 1300 tons, and 60,000 feet of steel h-piling.

Construction Methods AND EQUIPMENT

A McGRAW HILL PUBLICATION

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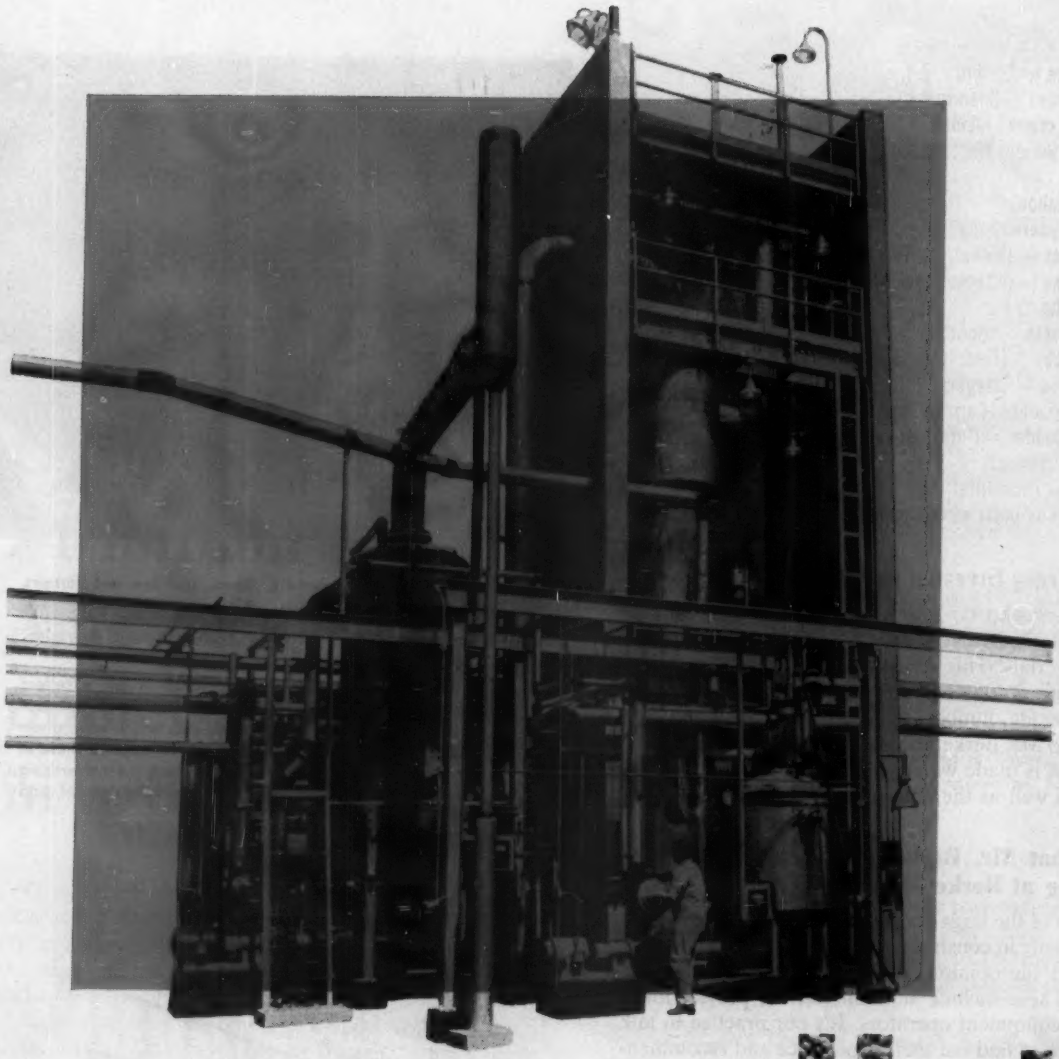

Now Ammonium Nitrate in pellets

New $5,000,000 Atlas Plant
Produces Unique, Improved Blasting Agent

Atlas is now producing low cost Ammonium Nitrate in a new pelleted form designed especially for blasting. Atlas Pellets give oil absorption equal to prills, and flow freely for fast loading into all types of blast holes. The new blasting agent is being made in the new $5 million Atlas acid and ammonium nitrate plant near Joplin, Mo.

Not a granule, not a prill, Atlas Pellets are porous but compact particles which, when oiled, have both the density and sensitivity required for efficient low cost ammonium nitrate blasting. They are the latest advance in developing new products and techniques to help the user of explosives gain lowest possible blasting costs. Your Atlas representative can help you put these products and techniques to profitable use in your operation.

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WILMINGTON 99, DELAWARE
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OUTSIZE HARROWS replace ordinary scarifiers at Oahe Dam. They mix the fill to attain optimum moisture content for rolling. The disks are 21 ft wide and accomplish the job in three passes. Each harrow consists of four units and weighs as much as 25,000 lb.

Giant Disks Till Oahe Fill

THE FARMER'S disk harrow has grown up to tackle heavy construction jobs. Such units, weighing as much as 25,000 lb, are mixing the fill on the Oahe Dam project near Pierre, S. D.

The harrows are efficient—Three of them have replaced seven scarifiers formerly needed. The scarifiers had to make five to six times as many passes as do the disks.

The harrows are big. Two of them have 38-in.-dia blades, and a third has 36-in. blades. Overall width of the units is 21 ft.

Western Contracting Corp. of Sioux City, Iowa, has the contract for Stage 7 earthwork at Oahe. They are using the disks in mixing the 13 million cu yd of fill that go into the embankment on this stage of the job.

Difficult Soil

The determining factor in using these disks was the nature of the material underlying the borrow areas. It consists of Pierre shale with thin layers of bentonite that separate the shale blocks and constitute fault planes. Water reaching the bentonite would lubricate it and cause the shale to slide. Yet water has to be added to bring borrow material to optimum moisture content for compacting.

On other stages of the earthwork pre-wetting was used extensively. But Army Engineers banned pre-wetting on Stage 7. So Western waters the fill instead, and works-over each lift with the big harrows.

OPERATING POSITION—The blades work best with front units at 20 to 30-deg pitch.

Placing the Fill

Material hauled to the fill area is deposited in windrows and leveled by Cat D9 dozers. After rocks are removed, the material is bladed and watered. Then the disks go to work.

They mix the soil, uniformly distributing the added water to increase the moisture content from an original 3% to the optimum 7%. When this moisture content is reached, rollers compact the material to the specified 95% density.

It takes only three passes with the disks to achieve the desired mix. The huge blades can handle a lift 12 in. deep and 20 ft wide. When scarifiers were used, 15 to 20 passes were necessary. The contractor is placing about 80,000 cu yd of fill per 20-hr day.

The Disks

The disks consist of four individual units. Eight dished blades placed on 16-in. centers make up each unit. An enclosed-oil-bath axle provides a maximum clearance of 16¼ in. from blade edge to axle spool. A 5/16-in. stationary scraper blade cleans the leading edge of each cutting blade.

Six 3x¾-in. carriage bolts connect each blade to the axle spool. The bolt heads are on the cutting side of the blades. This reduces obstruction and increases holding power. Frames of the 4-ft high harrows are constructed of structural angles and steel bars 2 in. thick and 8 in. wide.

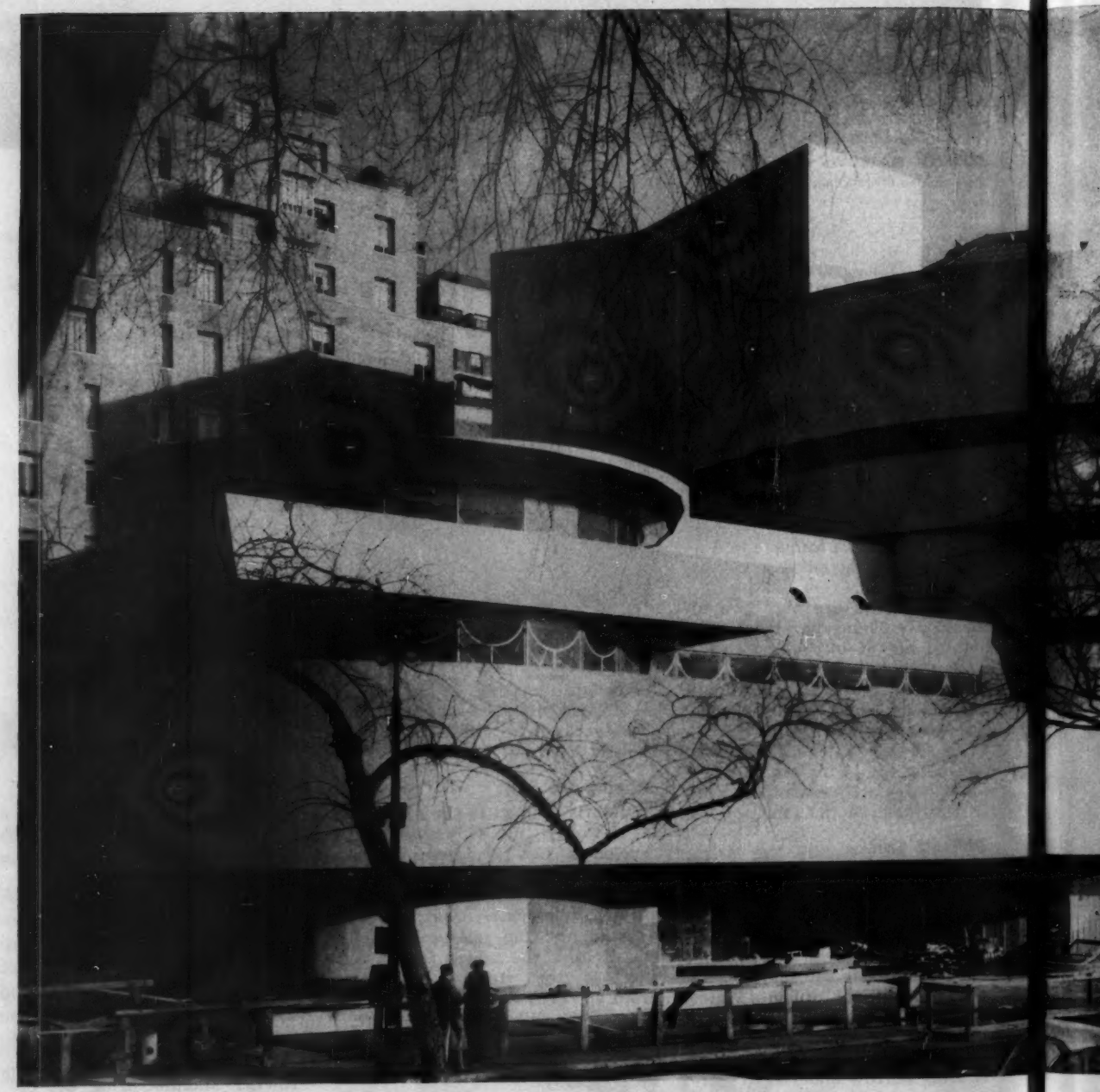
Cat D9's pull the harrows. A cable from a winch on the tractor regulates the depth of cut and the angle of the disk. On the Oahe material, the blades work best at a 20 to 30-deg pitch.

The disks also are useful in aerating wet fill after rain. The disked fill dries out quickly enabling the contractor to resume work promptly.

Towner Manufacturing Co. of Santa Ana, Calif., built the giant disk harrows. Bethlehem Pacific's San Francisco shipyard fabricated the blades and supplied the carriage bolts and framework steel.

"...never any choice but fi
for concrete forms o

says



PHOTOGRAPH BY EZRA STOLLER

SOLO
LOCA
ARCH
GENE

ut fir plywood
s on Guggenheim Museum"

says Charles Spero, job superintendent, Euclid Contracting Corporation

SOLOMON R. GUGGENHEIM MUSEUM
LOCATION: New York City
ARCHITECT: Frank Lloyd Wright
GENERAL CONTRACTOR: Euclid Contracting Corp.
New York City

Once again, fir plywood's superiority as a form material is dramatically demonstrated—on Frank Lloyd Wright's Solomon R. Guggenheim Museum, New York City. Plywood was used almost exclusively for the form work on all walls, on the curving ramps, and even on the 4-foot diameter columns.

"The job could not have been done without plywood," says Superintendent Spero. "Because everything is curves here, of constantly changing radii, there was never any other choice. It's smoother, certainly more durable, and cheaper in the long run."

Other advantages cited by Mr. Spero: handling ease, a minimum of cutting, a reduction of finishing time, very little backing required.

Put plywood's advantages to work for you. For information on specification and use, write (USA only):

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON
—a non-profit industry organization devoted to research, promotion and quality control

ALWAYS SPECIFY DFPA-QUALITY TRADEMARKED PLYWOOD. Grades manufactured expressly for concrete form work include:

INTERIOR PLYFORM®—standard concrete form grade plywood made with water-resistant glue. Gives multiple (up to 10-12) re-uses.

EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.

OVERLAID PLYWOOD—special panel with hard, glossy, plastic-like fused resin fiber surfaces. Forms smoothest concrete; up to 200 re-uses.

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Does it really matter if a carrier frame has had a stress analysis . . . if all welds are cleaned and ground . . . if the best component parts are used? At Hendrickson, it *does* matter. Hendrickson engineers and craftsmen *never take quality for granted.* Because of this, Hendrickson customers *can always take quality for granted.*

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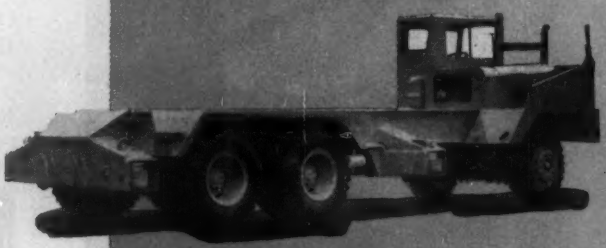

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Trailing Axle Six Wheel "Pusher Type" Tractor
Tandem Axle Semi-Trailer
Six or Eight Wheel Full Trailer
Portable
Six Wheel
Eight
Eight Wheel Tractor and Eight Wheel Semi-Trailer

MUD—Schield Bantam clamshell clears muddy erosions from water-filled trench. Moving across boggy right-of-way, it will dig out dirt road crossing in the background just before pipe is lowered-in.

ROCK—Gardner-Denver twin drills, mounted on International side-boom tractor that tows Ingersoll-Rand 600-cfm Gyro-Flo compressor, bores shale and quartz outcropping for blasting from pipe trench.

Pipeliners Buck Mud and Rock

A SURFACE of rainsoaked clay and loam and a subsurface of shale and quartz—these were the obstacles confronting a pipeline contractor along a 100-mile right of way in the North Carolina Piedmont. Yet, in spite of these adversities, pipeliners built a makeshift roadbed across muddy terrain, hauled in earthmoving equipment, and averaged out trenching operations to 8,000 ft per day.

Planning the Job

C. N. Flagg & Company, Inc., Meriden, Conn., installed 3 to 6-in. feeder pipe east of Charlotte for North Carolina Natural Gas Corp. through a winter, spring, and early summer of heavy rainfall. In planning the job, Flagg, taking into account rock and maximum rainfall with its consequent high water table and poor traction, decided to:

- Handle the job with a spread of 75 men split into nine crews working as close as possible to perfect sequence. As a rule of thumb each crew would keep about 2,000 ft apart. This gave the spread boss sufficient latitude to bolster one crew at the expense of another. It also permitted enough specialization and independent work to prevent the whole operation from bogging down because of the inability of one particular crew to function in bad weather.
- Assign one free-roaming International TD-18 dozer to shuttle between the trenching and pipe-stringing crews and perform multiple tasks. This proved effective because these two crews were subject to the greatest delay. The dozer hauled a pipe-trailer through 3 ft of mud, temporarily refilled ditches at dirt road cross-

Crews Set Rapid Pace Working in Sequence

DIGGING THE DITCH—In rare instance of ditching through dry and rockless area, Cleveland Trencher sets fast pace in open field.

BLOCKING THE PIPE—Pipelaying crew, aided by a single side-boom tractor, blocks pipe alongside trench for welders. Pipe al-

ings, towed an armored powder storage magazine, and covered partially excavated trenches before blasting.

Controlling the sequence required accurate field checks and daily work progress reports from field to headquarters, plus seasoned judgement on the part of the spread boss.

At no point did the right of way run alongside a paved road. Flagg had to clear a swath 30-ft wide through back country to gain access for earth-moving equipment.

Moving Out

In all, Flagg amassed for the job: nine dozers and side-boom tractors, one Cleveland trencher, one Schield Bantam crawler crane with clamshell, and one Bucyrus-Erie and one Koehring backhoe.

As the first step, 23 men on the clearing crew moved out with four power chain saws, felling timber and burning brush. The grading crew followed with four men and two dozers. Traction was poor. Often an operator anchored his dozer to a tree base to pull a stump with the winch.

Mud and rock contributed in equal proportion to hinder ditching. The trencher, making frequent use of its hoist cable, stripped soil off the rock, or cut a clean trench whenever possible. When it hit bucket-clogging clay, a backhoe followed to complete the ditching job. By this system Flagg kept a fast ditching pace even when crossing drainage areas or low, marshy ground.

The trenching crew dug and blasted through 5 ft of hard bottom in two crossings of the Rocky River. Draglines were not needed; a backhoe waded out at the point of crossing.

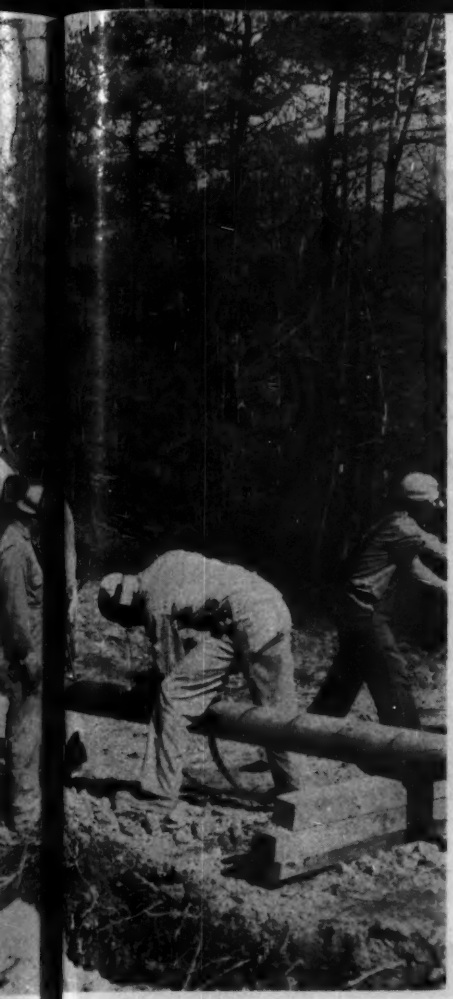
Rock was encountered frequently in outcroppings and below grade. Gardner-Denver twin drills, mounted on an International side-boom tractor that towed an Ingersoll-Rand 600 cfm compressor, made the borings for dynamite. This operation required three workers, one on the tractor and two on the drills. High-carbon bits bored through shale; quartz required tungsten-carbide inserts. After the shooting, another backhoe removed the debris.

Four Separate Crews

Flagg used four separate crews between trenching and backfilling to block pipe, weld it, coat it, and lower it in. To prevent damage pre-coated pipe was removed manually from the trailer. A pipelaying crew of seven men blocked up the pipe alongside the trench, or, whenever necessary, bent it to conform to the terrain.

One welder worked with the pipelaying crew to make a stringer bead. The finish welders used two 200-amp Lincoln welding machines. A third, truck mounted, was used for equipment repair. Breakdowns were few in spite of the rough going.

After welding and coating of the pipe ends and welding mate-



ready has been bent to conform to hilly terrain. Welder makes stringer bead.

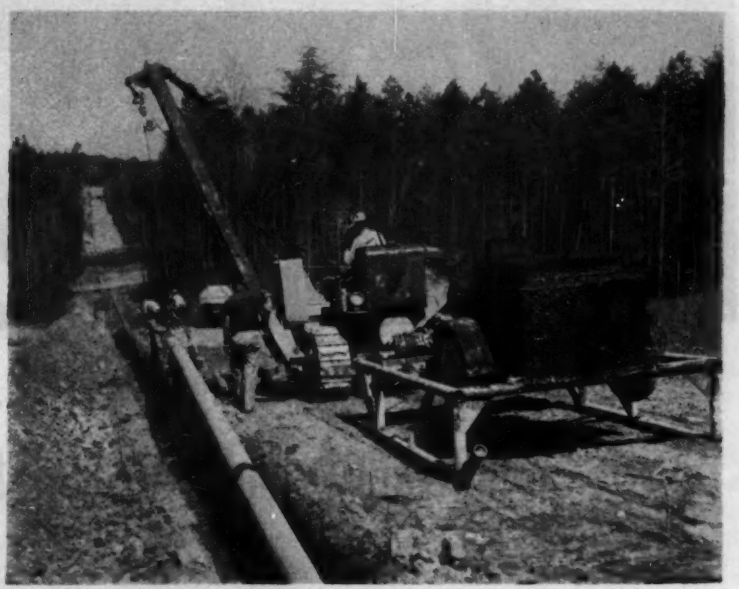
rial, but before lowering-in, a clam dug out the crossings again and cleared erosions or cave-ins from the trench. A side-boom pulled the melting pot used for liquefying the asphalt-enamel coating.

As a special feature of lowering-in, the usual belt slings were eliminated. Instead, four rubber pneumatic tires were built into a cradle that lifted the pipe and lowered it into the trench. One tractor driver and swamper operated this rig, replacing the two tractors and five men normally needed for pipe this size. The lowering-in crew also wrapped rock shield.

Two dozers handled backfilling chores. A Caterpillar D6 plus six workers on clean-up crew mended fences and left only a treeless path to show where the pipeliners passed through.

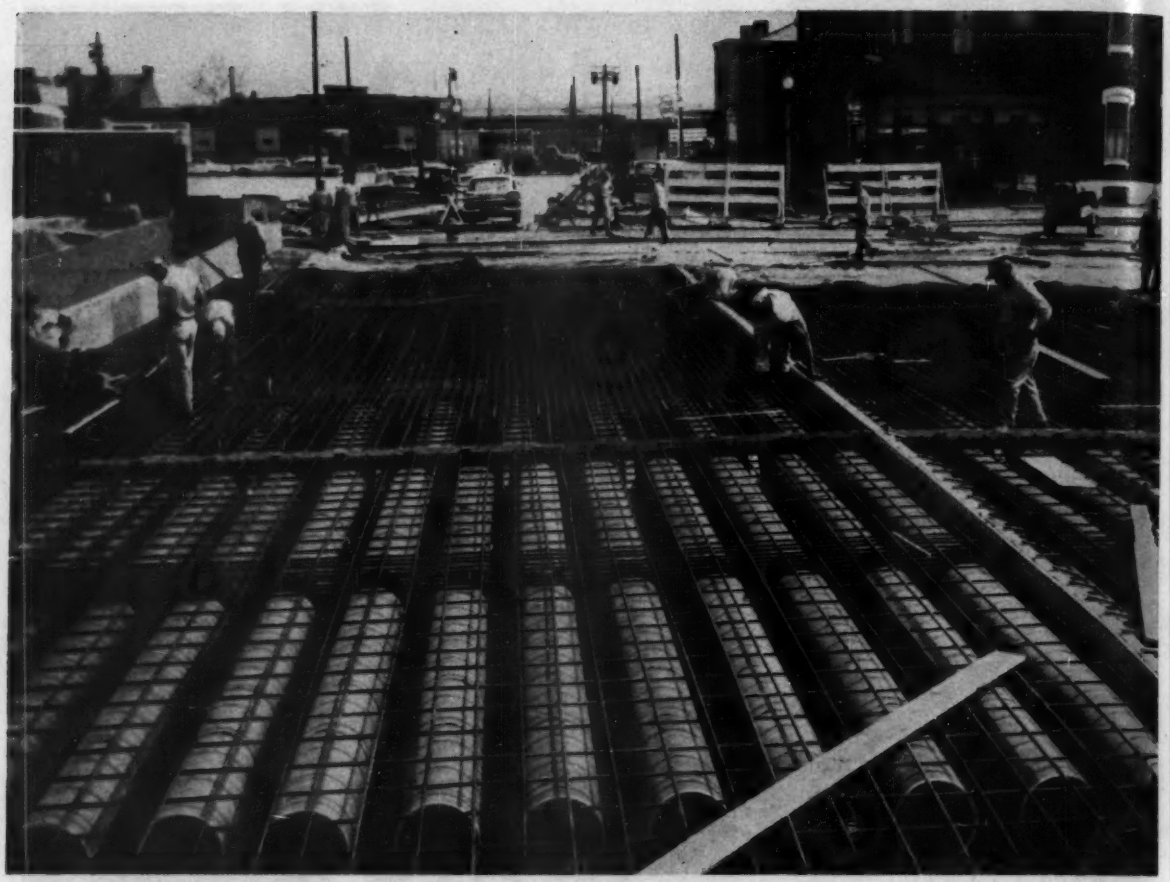
William Hoofnel, southern superintendent for Flagg, had overall charge of operations. Jack Chaney was spread boss.

THE FINISHING WELD—Finish welder, using 200-amp Lincoln welding machine, completes weld. After joining, bare pipe ends are coated with liquefied asphalt-enamel.



LOWERING-IN THE PIPE—Pneumatic tires built into cradle suspended from side- boom roll pipe into trench as tractor advances, towing melting pot with coating compound.

CLOSING THE TRENCH—Caterpillar D6 handles backfilling chores. Rock shield wrapped around pipe protects it from damage. Clean-up crew will follow to complete sequence.



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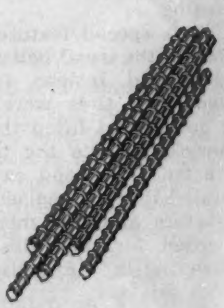

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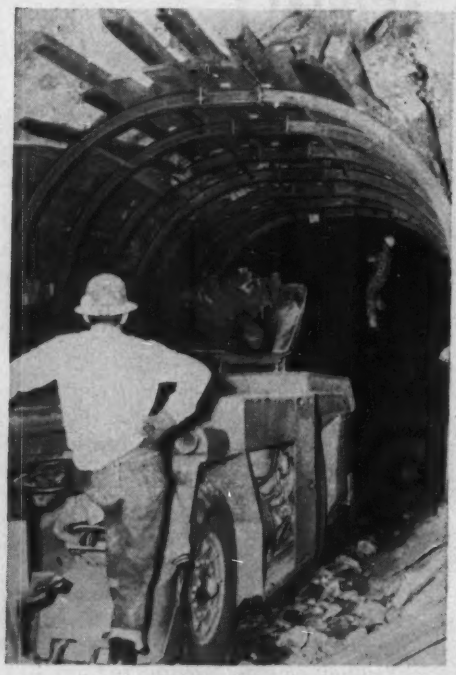

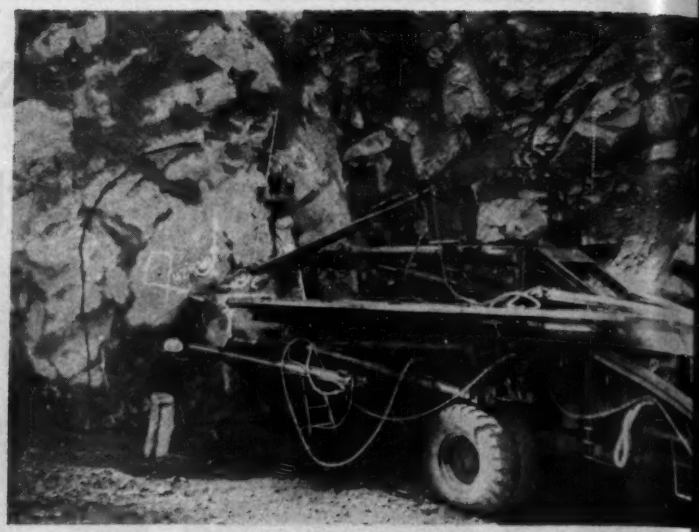

"... useful in keeping up with the work under progress."

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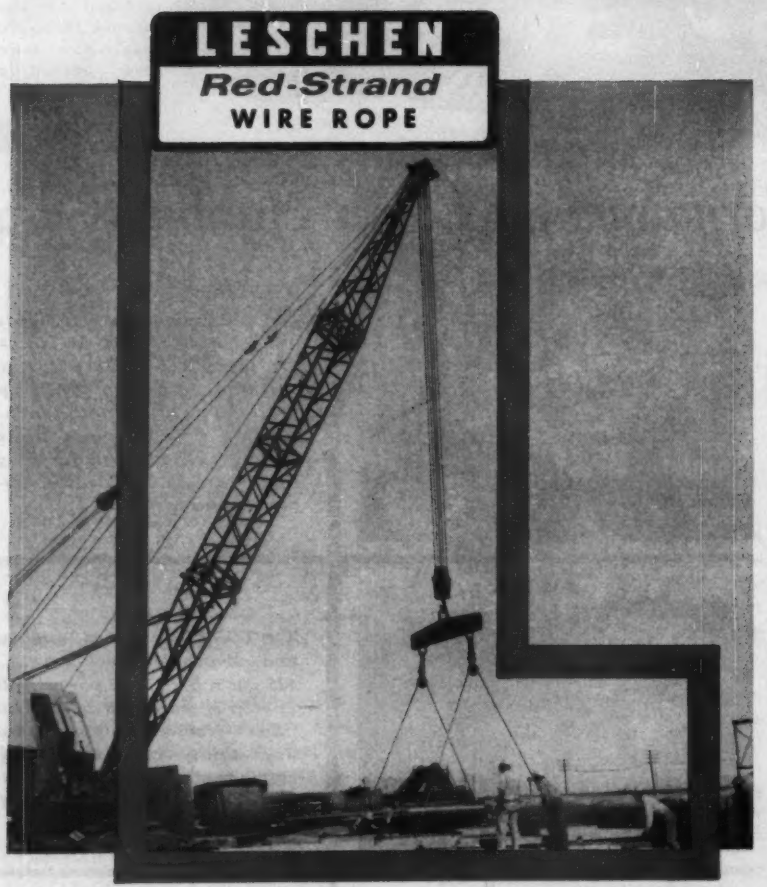

When the load is on the crane, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

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Clark Equipment Co.: Central Machinery Co. of Abilene, Tex., has been appointed distributor of the "Michigan" line of construction machinery.

Highway Equipment Co.: The following distributors have been appointed: G. K. Machinery Co. of Boise, Idaho; Herman M. Brown Co. of Des Moines, Cedar Rapids, Sioux City, Iowa, and Rock Island, Ill.; T. S. McShane Co., Inc., of Omaha, Neb.;. Faris-Moritz Equipment Co. of Denver, Colo.; Bert Smith Road Machinery Co. of Enid, Okla.; Westate Machinery Co. of Billings, Mont.; Flesch-Miller, Inc., of Indianapolis, Ind.; and Central Machinery Co. of Abilene, Tex.

Radio Corporation of America: The following three manufacturer's representatives have been appointed for RCA mobile communications equipment: Delta Communications, Inc., of New Orleans, La.; Klaus Radio & Electric Co. of Peoria, Ill.; Electronic Associates, Inc. of Midland, Tex.

Western Machinery Co.: The following distributors have been appointed: Construction Equipment Co. of Birmingham, Ala.; The Telford Equipment Co. of Lansing, Mich.; The Power Equipment Co. of Knoxville, Tenn.; and Lowe Machinery Co. of Skokie, Ill.

Aeroquip Corp.: The following distributors have been appointed: Dixie Engine Co. of Atlanta, Ga.;

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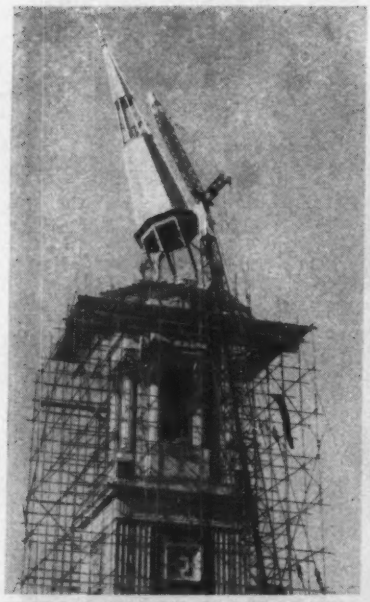
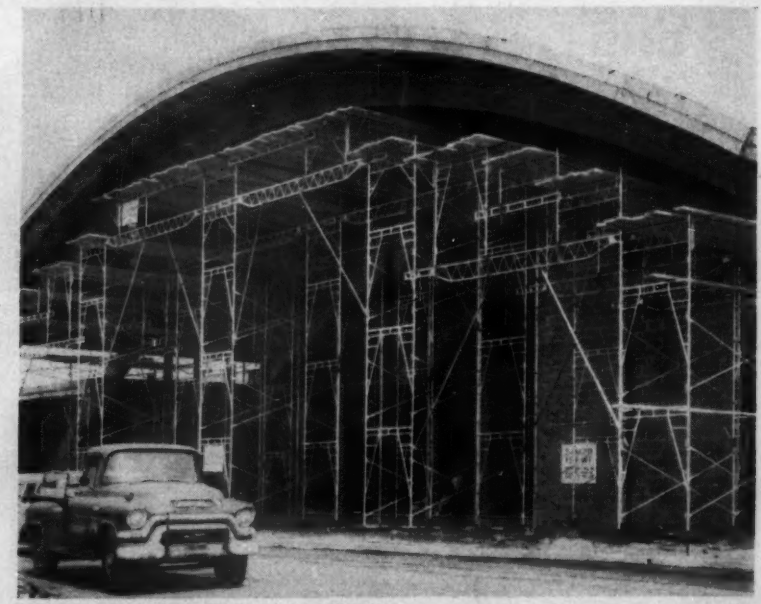
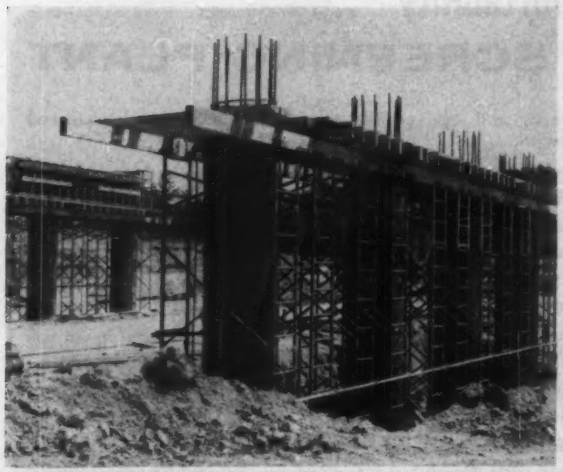


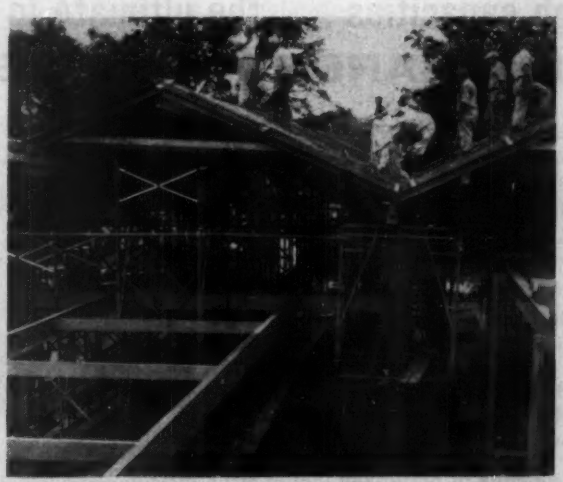
STEEPLE WORK PLATFORMS—Workmen for J. P. Roberts & Sons, contractor, guide into place a new steeple on this church. Wide, stable platforms made of "TubeLox"® Steel Scaffolding are built up rapidly.



PERFECT ACCESS FOR PLASTERERS—To give plasterers the right working heights at the underside of the curved, cantilevered roof of the Penn Fruit Building, Bergen Mall, Paramus, New Jersey, the contractor, Acme Plastering Company, uses "Trouble Saver"® Sectional Steel Scaffolding. First, frames are erected in towers. Then, they are joined by trusses which lock the units together and also make wide platform areas.



HEAVY PIER SUPPORT—On the North-South Ohio Turnpike, joint venturers, Kiewit-Condon-Cunningham, provide support for the formwork for these bridge piers by using "Trouble Saver" Shoring made from 2′-wide ladder frames erected to 26′-high towers spaced 5′ apart. Built-in ladders provide easy access for forming work. 20″ adjustable legs permit exact height adjustment.



SHORING A FOLDED PLATE ROOF—To make sure that the angle joints of this folded plate roof system do not move when the concrete, 4″ to 6″ thick, is poured, the contractor, Brick and Concrete Construction Co., uses "Trouble Saver" Sectional Steel Shoring placed to support the impact load on each adjoining folded plate section. New Charter Road School, Acton, Mass.

50 YEARS OF SERVICE
1909-1959
THE PATENT SCAFFOLDING CO., Inc.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDINGS

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SALES AND SERVICE...
continued

Auto Parts & Electric Co. of Statesville, N. C.; Bearing Chain & Supply Co. of Dallas, Tex.; Gas Supply Co. of Minneapolis, Minn.; Cummins Diesel Sales Corp. of Hialeah, Fla.; Bloomington Battery Service Co. of Bloomington, Ill.; Tasco Products, Inc., of Geneva, Ill.; and Cummins Diesel Sales Corp. of Jacksonville, Fla.

On the Sales Front

SKF Industries, Inc.: David B. Eden has been appointed to the newly created position of director of distributor sales. He will be responsible for all domestic distributor sales and the operation of field warehouses.

Sika Chemical Corp.: Daniel Guntin has joined the technical sales staff of Sika. He will serve architects, engineers and contractors in the metropolitan New York area.

Olin Mathieson Chemical Corp.: R. H. Benedict, Jr., has been named sales manager for Ramset Fastening System.

Bucyrus-Erie Co.: Charles B. Brockmeyer has been appointed sales engineer, dragline buckets and dippers, and Frank T. House has been named sales development manager. Both men are stationed at the company's home office in South Milwaukee. Douglas E. McCuaig has been appointed product engineer in charge of the Hydrocrane Division.

The Joyce-Gridland Co.: Robert M. Tormey has been named sales manager of the newly formed Industrial Division of the company.

The General Tire & Rubber Co.: The following sales appointments are announced: Kenneth M. Smith, manager of truck tire sales for the Akron Division; George E. Bowling, manager of special purpose tire sales for the Cincinnati and Memphis Divisions; John L. Manley, manager of truck tire sales for the New York Division.

The Upson-Walton Co.: Henry B. Korman has been named director of sales and LeRoy M. Hosick has been named sales manager.

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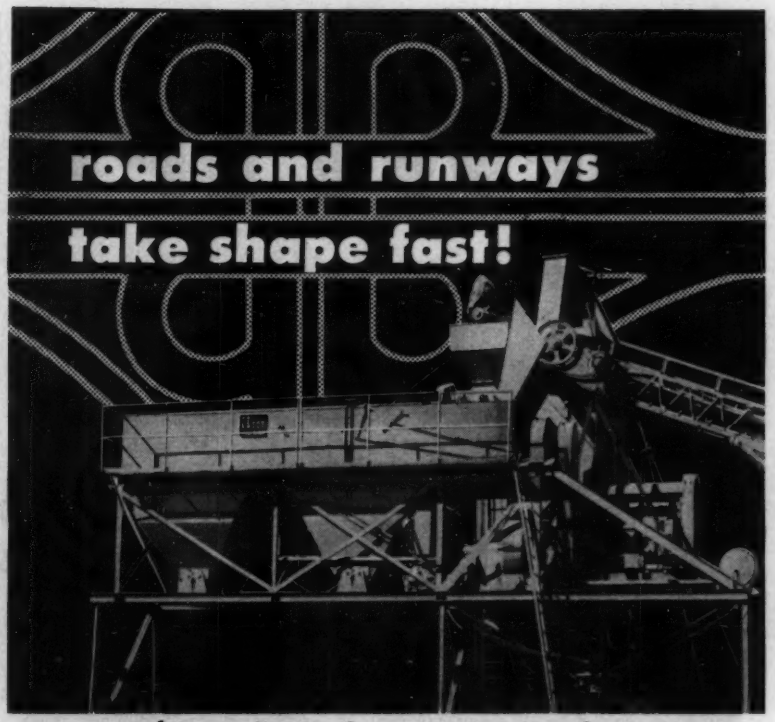

with a Boardman Central-Mix
STABILIZATION PLANT

Highway and airstrip stabilized bases take shape twice-as-fast when you have twice-the-capacity . . . with the industry's first 1000-tph Central-Mix Stabilization Plant, by Boardman.

This plant was built by Boardman with the contractor in mind . . . to cut his production costs and increase his profits. It outproduces all others, yet remains in a *competitively-priced* field. Exclusive Boardman features like the double discharge hoppers add more speed in loading, increase your efficiency.

Whether it's a stabilized aggregate or soil-cement base, you'll find dollars saved in its preparation when you place Boardman's 1000-tph plant, or its 500-tph counterpart, in your construction picture.

Your letter or phone call will bring the name of the distributor nearest you, along with an illustrated brochure from Boardman . . . fabricators and engineers of construction machinery for more than 40 years. Write today!

the industry's FIRST 1000-tph Plant

Distributor Franchises Available in Selected States.

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THE BOARDMAN CO.

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If it's
"NEWTYPE"
The Pumps Are
Making Progress!

ON ALL SUCTION AND
DISCHARGE OPERATIONS

BLACK
COVER

GREEN STRIPE

You can't beat "NEWTYPE" for steady, trouble-free, low-cost pumping! It won't kink, buckle or collapse—always a full, fast flow. Its tough, durable construction will stand plenty of hard use—longer service before replacement. Sizes 1¼" to 4", in maximum lengths of 50 feet.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES.
IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

SALES AND SERVICE...
continued

In the Main Office

Blaw-Knox Co.: William Rodgers has been named senior vice president of the company. He joined the company in 1953 and in the same year was named vice president and general sales manager. In his new post he will continue as general sales manager. In 1956 he was elected a director of Blaw-Knox.

The Garrett Corp.: Walker C. Brownlee has been elected administrative vice president of the company. He joined Garrett in 1939 and was a vice president and director during World War II. He left the company in 1948 and rejoined it in 1958 as assistant to the president.

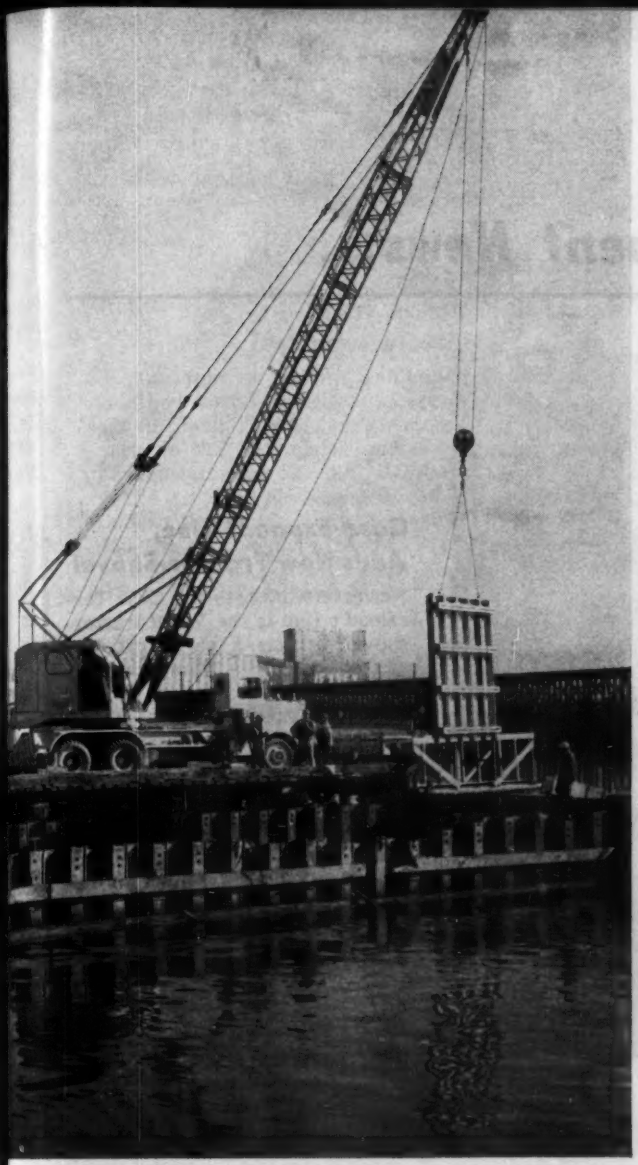
Associations

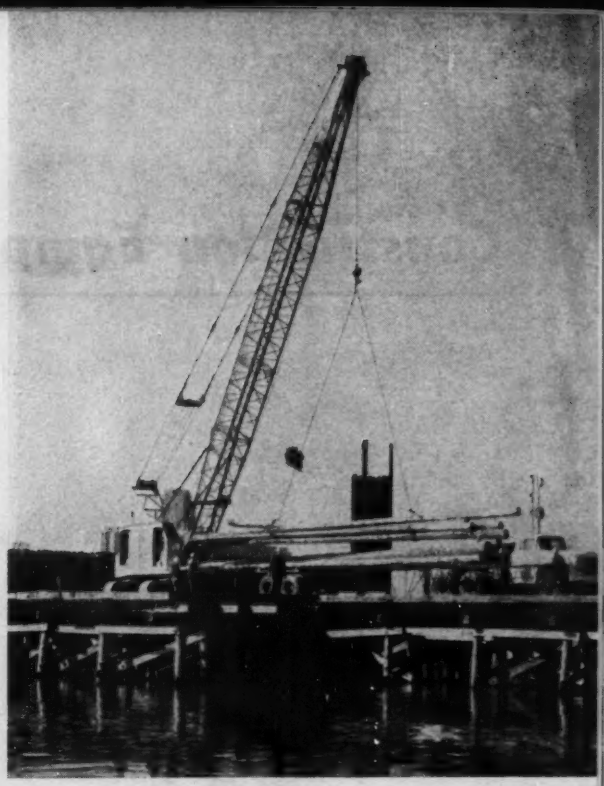
American Road Builders' Association: Harry Haller has joined the ARBA staff as director of membership and special events. A former reporter and feature writer for the Baltimore Sun, Haller has worked for a number of public relations firms in New York and has also been associated with several other associations.

Special Mention

Moretrench Corp.: The Moretrench Corp. after 30 years at 90 West St., New York City has moved its Eastern District office to 389 Main Street, Hackensack, N. J. At the same time, American Dewatering Corp., an affiliated company, transferred its principal office from 140 Cedar St., New York City, to the Moretrench main office and plant at Rockaway, N. J. and established a district office at the new Hackensack address.

Bethlehem Steel Co.: Technical changes in the corporate structure of Bethlehem Steel Co. will make no difference in the company's West Coast personnel or operations. On July 1, Bethlehem Pacific Coast Steel Corp. was abolished. Business formerly conducted by that corporation's Steel Division will now be conducted by Pacific Coast Division of Bethlehem Steel. Business formerly done by the California corporation's Shipbuilding and Ship Repair Division will now be done by Shipbuilding Division, Pacific Coast District.





Driving Piles...
Placing Forms...
Setting Steel...
Spotting Concrete Buckets...
Moving Quickly from Site to Site...

YOU NAME IT...AMERICAN CRANES DO IT!!

Pushing toward an early 1960 completion of the Duluth-Superior Interstate Bridge, Johnson, Drake and Piper, Inc., Minneapolis contractors and engineers have two American Cranes on the job to speed up their $1,850,000 contract for construction of eight main piers. In the large illustration, an American 300 Series Truck Crane, with 65′ boom, is placing forms for a second 10′ pour in the cofferdam. With H-beams driven down 100 ft., the first pour was also 10′ in this 94′ x 24′ pier, one of four smaller piers. Four additional piers, 107′ x 42′ and 100′ high are believed to be among the largest ever built in the State of Minnesota. Fifty-two piers are required for the entire structure. The new bridge, replacing an ancient revolving toll bridge, will now permit ships of all sizes, from all parts of the world to enter the inland port via the St. Lawrence Seaway.

In the smaller illustration, an American 500 Series Crawler has just completed its clamshell work and is now loading out piling for transport to another site. Working as a team, these two Americans are making short work of a long span.

Versatile machines, with interchangeable fronts, American Truck and Crawler Cranes are ideal for construction jobs of this kind. They're well equipped to handle any assignment that comes along. Your American Distributor can provide you with detailed and illustrated catalog information that will show you how American Cranes and Excavators will help you cut construction costs and time on your next job.

DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

EXCAVATORS-CRANES to 2 yds.-60 tons
LOCOMOTIVE CRANES to 130 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

Construction Equipment News...

Case Expands Line, Adds New Tractor-Shovel

Newest addition to the Case Terraload'r line is the W-10 tractor-shovel. It has a carry capacity of 6,500 lb and a lifting capacity of 13,000 lb.

Three bucket sizes are available. A 2-yd bucket is standard. Optional are a 1¼-yd heavy-duty bucket and a 2⅞-yd light materials bucket.

A 6-cyl Case diesel engine powers the tractor. The 401-cu in. engine develops 100 hp. The unit has four-wheel drive and rear-wheel steering. Power steering, torque converter, and power-shift transmission are standard, as is a 24-volt electrical system for engine starting — **J. I. Case Co., Racine, Wis.**

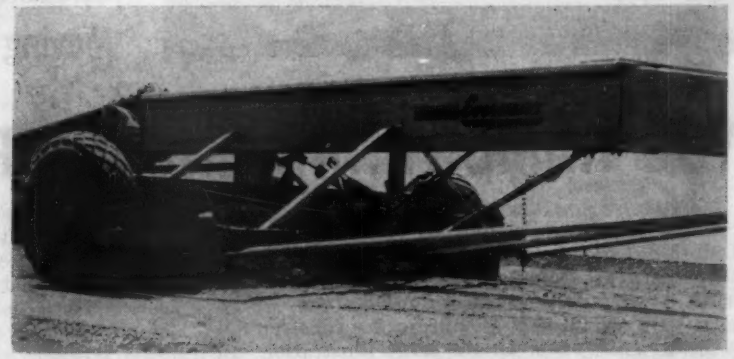
Leveling Machine Speeds Subgrade Finishing

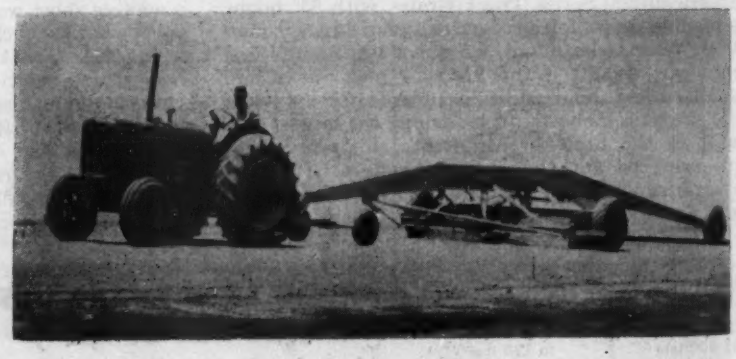
The Highway Plane, a long-span leveling machine with a wheelbase of 40 ft, smooths subgrade and base course after the spreading and shaping is completed.

The plane has a 10-ft cutting blade, hydraulic controls, and a hinged frame that permits turning on a 22-ft diameter. A 40 to 45-hp tractor can pull the machine.

The unit is effective in eliminating grade irregularities if particle sizes do not exceed 1½ in. A double-throw crank axle automatically controls the blade: The wheels are mounted on one throw and the blade is connected to the other.

The wheels are free to work up and down over irregularities of the grade. Spring tension keeps the wheels following the roadbed. **—Eversman Manufacturing Co., Denver, Colo.**

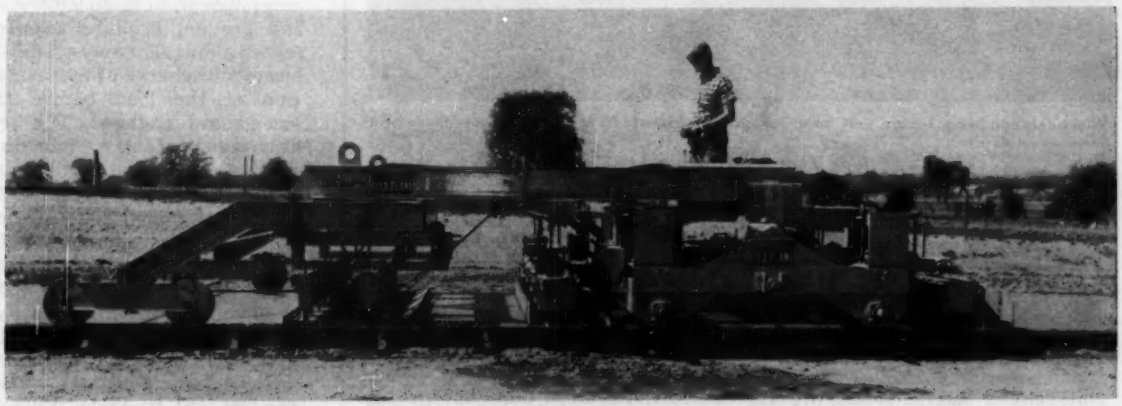


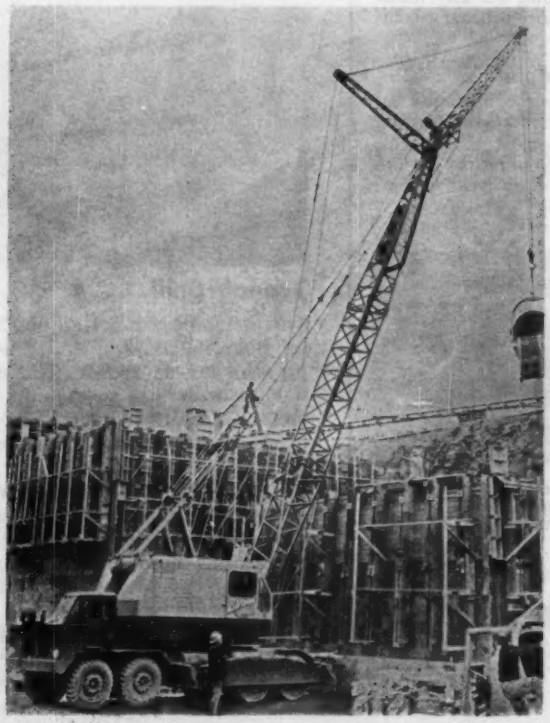


New Rotation System Improves Blasthole Drilling

A dual rotation system eliminates conventional rifle-bar-actuated reverse rotation on the Joy 450-DR drill. A vane type air motor (arrow) connects to the drill chuck and is controlled independently of the standard rifle-bar rotation.

The rig was developed by adding dual rotation to the 4½-in.-bore TM-450 machine. The 450-DR can be mounted on either the self-propelled TDL or TDM Trac-Drill.—**Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.**





Detachable Finisher Section Operates as Independent Machine

The self-contained finisher section of the Flex-Plane finisher-float can be detached and used independently. Its frame adjusts in width from 12 to 26 ft. Two separate gas-electric drives power the unit, giving infinite speed ranges to drive wheels and screeds. The rate of machine travel does not affect screed operation. Each of the machine's two sections can be mounted on wheels for highway travel.—**Flexible Road Joint Machine Co., Warren, Ohio.**

Five Tons of Removable Outriggers Reduce Weight for Highway Travel

The outriggers of this Manitowoc truck crane can be removed to reduce its weight by five tons for highway travel. The counterweights are removable also. The Model 2800 mobile crane has a capacity of 45 tons at a 15-ft radius.

The standard boom is 40 ft. Longer booms and adjustable cantilever jibs up to 50 ft long are also available. The undercarriage has dual tandem rear and single tandem front axles, power steering, and air brakes.—**Manitowoc Engineering Corp., Manitowoc, Wis.**

continued on next page

With safety flag flying, 3-wheel A-W roller "takes-off" as it resurfaces new jet runway at Philadelphia International Airport.

Austin-Western 3-wheel roller speeds resurfacing at Philadelphia Airport

The contract called for resurfacing 5800 ft. of runway, 150 ft. wide, at the Philadelphia International Airport. Contractor James J. Skelly, Media, Pa., chose an Austin-Western 3-wheel 10-14 ton roller to lay the required 1-in. wearing surface over a 2-in. base of bituminous concrete.

Well pleased with A-W

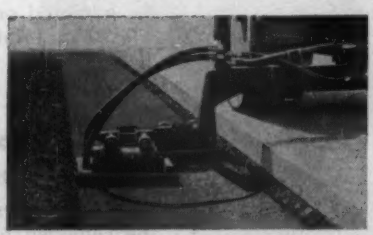
Mr. Skelly says, "I'm well pleased with the Austin-Western roller. It's more compact than most competitive rollers—easier to handle and gives the operator better visibility. Its V-8 engine delivers plenty of power, permitting the A-W roller to keep pace with the average daily output of 1600 tons of asphalt paving from two machines. There have been no maintenance problems. The A-W is an excellent roller—ideal for a progressive paving organization!"

Exclusive A-W features include hydraulic steering, full-width seats that let operators sit to right or left for better visibility; long-life oversize axles and antifriction bearings; many interchangeable parts; beveled outside roller edges that won't mark hot materials.

A-W 3-wheel rollers available in 8 to 11, 10 to 12, 12 to 14-ton models; tandems in 5 to 8, 8 to 12, 10 to 14-ton models. Portable tandem variable between 3½ to 6 tons. A-W vibratory Roller-Compactor unit fits any make 3-wheel roller; vibratory widener attachment also available.

A-W for profit

No matter what your compaction requirements, there's an Austin-Western roller to profitably meet your needs. Investigate! Consult your nearby Austin-Western distributor or write direct.



Vibratory widener attachment—for use with any 3-wheel roller equipped with A-W Roller-Compactor unit . . . may be mounted left or right.

Austin Western 100th YEAR 1859 AUSTIN-WESTERN 1959 PARTNERS IN PROGRESS

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

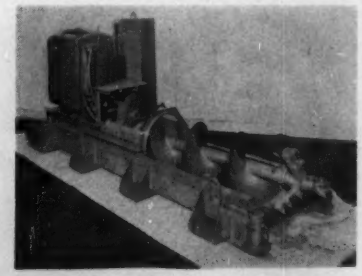
BALDWIN BLH LIMA-HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

Cement Hauler Unloads Itself

The twin screw discharge system on this trailer unloads cement at the rate of 5 bbl per min. Each screw has four air pads and is reversible to help dislodge lumps and prevent bridging over conveyor shields. The two-stage drive permits discharge of the rear portion of the load before front screws are engaged. The nylon discharge boot has a 14-in. downspout.

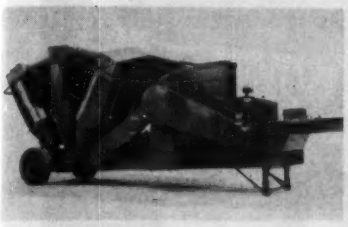
A tandem pump operated from the tractor power take-off drives the discharge system on this Dorsey BMC-T cement transport. A 25-hp air-cooled engine is optional for operation without a power take-off. The bulk transports are available in a wide range of capacitities and lengths.—**Dorsey Trailers, 401 Hickman, Elba, Ala.**



Trench Drill

This machine can drill a horizontal hole 400 ft long and push a pipe as far as 250 ft. The drill handles augers up to 24 in. in diameter. It operates from a trench at the depth at which a horizontal hole is to be drilled.

The 24-TD drill has a forward thrust of 30,000 lb and a maximum torque of 6,500 ft lb. A 52-hp gasoline motor powers the unit. A four-speed transmission, electric starter, a pipe pusher, and one guide are standard equipment. Variable hydraulic feed in a rigid frame insures drilling accuracy.—**Salem Tool Co., Salem, Ohio.**



Dust Collectors For Asphalt Plants

Three new models of Barber-Greene's cyclone-type dust collectors range in capacity from 12,000 to 40,000 cfm. Each of the collectors is available as a portable or a stationary unit.

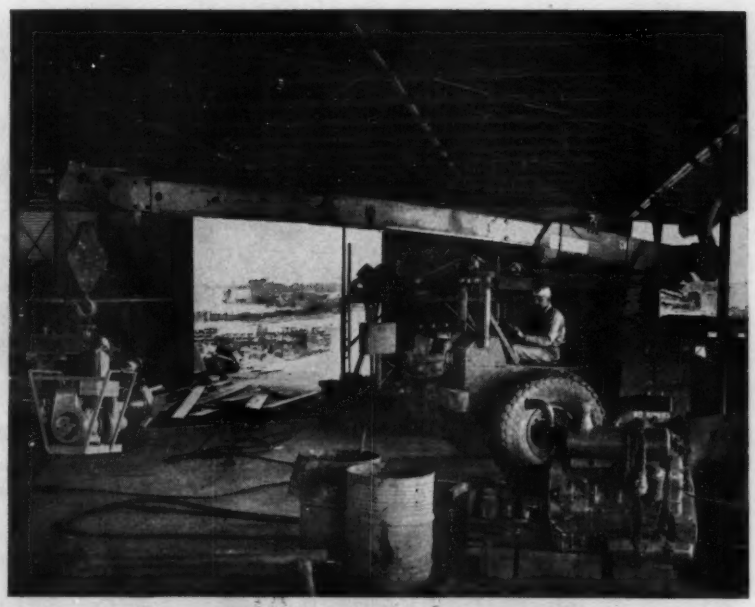
The portable units are equipped with single axle running gear, fifth wheel towing hitch, and extensible jackleg supports. The chassis supports the cyclone and power units, the high or low-pressure fan, and all ducting except the connection with the dryer exhaust. The stationary models have a separate skid-mounted power unit and fan.

All models employ the multiple cone collection principle. The CA-50 collector uses a single bank of three cyclones; the CA-60 has two banks of three cyclones each; and the CA-70 has three banks, or a total of nine cyclones. **—Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**

Vibratory Roller

A new Vibratrail roller produces approximately 1,400 vpm and develops a centrifugal force of 5,000 lb. The manufacturer claims that the compacting effort of this roller is equivalent to that of an 8 to 10-ton deadweight roller. The roller compacts at speeds of up to 4 mph.

The 31-in.-diameter roll is 60 in. long. The roller weighs 3,000 lb. Ballasted weight is 4,400 lb. A Wisconsin engine powers the unit. It has a clutch takeoff and a double V-belt drive.—**Western Equipment Div., Douglas Motors Corp., 1234 N. 62nd St., Milwaukee, Wis.**



5 ton range A-W 210 hydraulic crane works easily in tight quarters with low overhead clearance.

T. L. James & Co. says:

Austin-Western hydraulic cranes . . . most useful multi-purpose equipment

"Our three Austin-Western hydraulic cranes are the most useful multi-purpose equipment we know of. We'd hate to have to try to do without them . . . they are the tops in materials handling units. We often wonder how we got along before we had them," says T. L. James & Co., Ruston, La., construction firm.

"We've had the A-W cranes for 3 years. They often work 9½-hr. shifts 6½ days a week. But maintenance has been no problem because of the quality and rugged construction of the units and our preventive maintenance program."

Reduces equipment downtime

They continue, "Reducing downtime, by speeding maintenance in the field on our $5-million equipment fleet, is an important dollar-saving duty of the cranes. They are used to remove and replace engines, transmissions, crawler assemblies, wheels, etc.

"All-wheel steering and low boom clearance are extremely important. These features permit the cranes to work in spots where no other lifting equipment can operate. All-wheel drive means plenty of traction. Hydraulic controls make it simple and easy to operate with precision. And it has lots of mobility for highway travel, too.

5 models available

Austin-Western hydraulic cranes are available in five models: The 110, 3-wheel design, 3-5 ton capacity; the 210, self-propelled, 5 ton capacity; the 210-P for truck or stationary mounting, 5 ton capacity; the 220, self-propelled, 6 ton capacity; and the 410, self-propelled, 10 ton capacity. Choice of power . . . wide selection of optional equipment for added versatility.

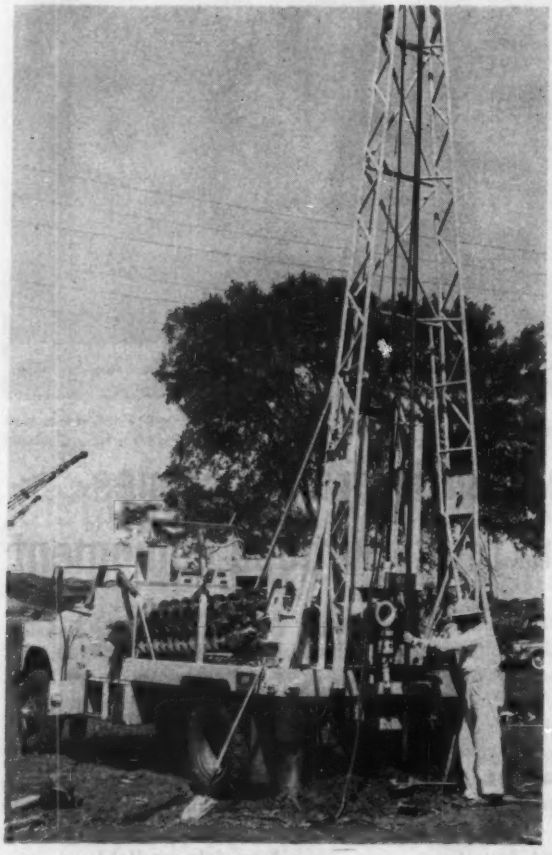
Investigate ways in which Austin-Western hydraulic cranes can make profits for you. See your nearby Austin-Western distributor now or write us.

Austin Western 100th YEAR 1859 AUSTIN-WESTERN 1959 PACEMAKERS IN PROGRESS

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes



Air Powered Attachment Improves Blast Hole Drilling

An air-actuated hammer-drill for the B-52 Pacemaker Mobile Drill improves blast hole drilling and increases the unit's versatility. The B-52 is the heaviest rotary drill of the Mobile line.

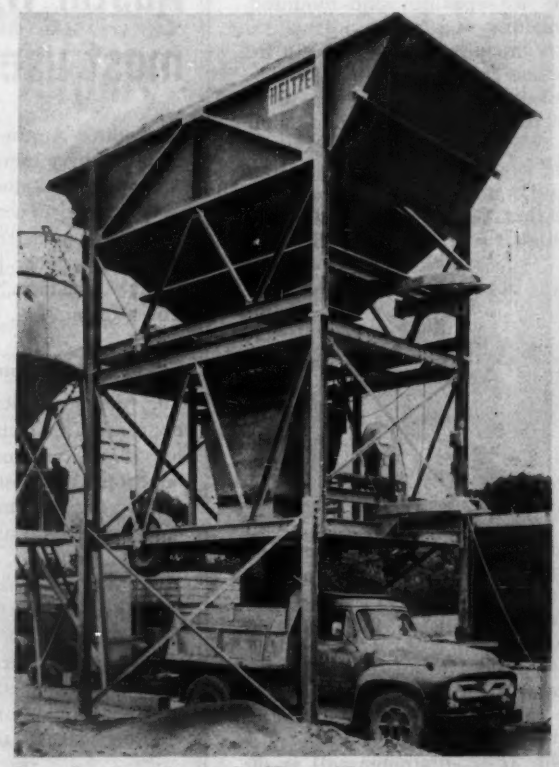
The combination drilling unit now includes an air actuated hammer-drill, a compressor, dust collector, the basic B-52 hydraulic rotary drill, and a four-wheel-drive carrier. With the new attachment the machine can drill up to 30 ft per hour through rock with a 4½-in. bit.

Power unit is a Ford JD-172 industrial engine. It is a four-cylinder, 61-hp water-cooled power plant with a 6-volt electrical system. Maximum drill torque output is 3,160 ft lb.—**Mobile Drilling Inc., 960 North Pennsylvania St., Indianapolis 4, Ind.**

Digs and Loads

The Ottawa Marauder is a self-propelled digging and loading unit. It can lift 4,500 lb; breakout power is 5,000 lb. The backhoe swings 190 deg and digs 12½ ft deep.

A Continental engine, torque converter, and four-wheel drive are standard. Top speed is 25 mph.—**Ottawa Steel Div., Young Spring & Wire, Ottawa, Kan.**



Ready to Move in Two Hours

All it takes is two hours to set up or dismantle the Heltzel mobile batch plant. Each section can be towed by any dump truck. The plant is available as a straight aggregate, straight bulk, or combination aggregate and cement unit. Aggregate capacities are 100 to 150 tons; cement capacities are 300 to 500 bbls.—**Heltzel Steel Form and Iron Co., Warren, Ohio**

Purolator saves money for Material Service Corporation

About a year ago oil bath air filters were removed from a number of trucks and compressors operated by the Material Service Corporation, Lyons, Ill. They were replaced with Purolator Dry Type Air Filters.

Once a week, thereafter units were inspected, checked with manometer gauge and results logged. Two months after installation, elements were removed for the first time, cleaned and put back into service.

For the Material Service Corporation, the result was clear-cut proof that vehicles equipped with Purolator Dry Type Air Filters could be operated over periods of 6 to 8 weeks without element servicing; that dry-type air filters could be used up to three months without element replacement; *"that savings up to $1000 per year per truck could be effected."*

Results on the compressors were equally as good, bearing in mind that the compressors were run on a tighter 24-hours-a-day schedule.

None of this is surprising. With Purolator Dry Type Air Filters all of the air must pass through the filter before reaching the engine. What's more, unlike oil-bath filters which depend on engine speed for peak performance, dry-type filters work at maximum efficiency regardless of engine speed. In fact, they gain in efficiency as the dirt load increases.

This positive protection extends periods between overhauls, helps prevent major repairs and wasteful down time. Maintenance expenses are lower, too. Low initial cost, re-use, easy changing assure this.

There are Purolator Dry Type Air Filters for all makes of trucks and industrial engines.

For complete information, send for a free catalog, or call your nearby Purolator Supplier.

FOR MAXIMUM ENGINE PROTECTION

PUROLATOR

"Purolator," Reg. U. S. Pat. Off.

Oil, Air & Fuel Filters

PUROLATOR PRODUCTS INC. Rahway, N. J.; Toronto, Ontario, Canada

MAIL THIS COUPON TODAY!

Purolator Products, Inc.
Dept. [illegible]
Rahway, New Jersey

Yes, I want more information about dry-type filtration for fleets.

Name_____

Address_____

City_____ Zone____ State_____

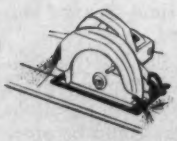
3 NEW SKILSAW POWER SAWS

...and new lower prices on 7¼" and 8¼" models!

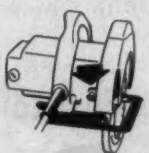
These new ball-bearing heavy-duty models are a perfect complement to the "Standard" of the industry—SKIL's Super-Duty Line. They're the ideal "extra" saws you need to cut down non-productive time and speed up construction. Best of all, prices are low enough to meet everyone's budget.

Just look at these exclusives... a new saw dust ejection system that directs dust away from the operator's face and line of cut. New "push button" blade lock for faster, easier blade changes... redesigned upper guard that permits full blade visibility... new easy-to-reach depth adjustment ...many others. And each has the famous SKIL "Vari-Torque" clutch for protection against kick-back and overloading of motor and bearings.

Now available from your SKIL Distributor. Call or see him today—ask for a demonstration—of course there's no obligation.



EXCLUSIVE! New ejection system directs dust away from operator and line of cut.

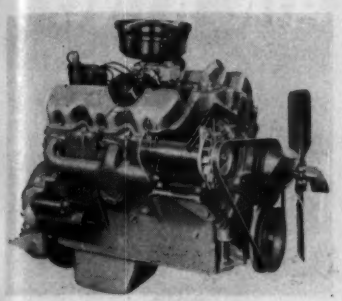


EXCLUSIVE! New Push-button engages, locks saw shaft permitting fast, easy blade changes.

NEW! Blade visibility is greatly improved, gives extra accuracy needed on critical cuts.

SKIL ...another basic Skil construction tool

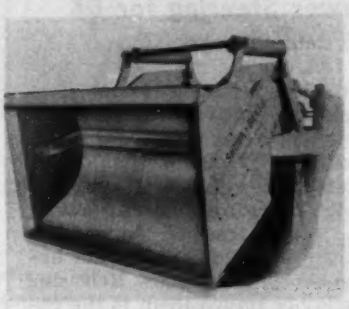
Famous SKIL and SKILSAW products made only by SKIL Corp., 5033 Elston Ave., Chicago 30, Ill. In Canada: 3601 Dundas St. West, Toronto 9, Ontario.



V-6 Gasoline Engines

General Motors has developed a new family of gasoline powered V-6 truck engines. GM claims that these engines give good performance and fuel economy and hold down maintenance costs because of easy access to engine components and reduced parts stocks. Availability date for these engines has not yet been determined.

Three of the V-6's have displacements of 305, 351, and 401 cu in. In addition, there is a Twin-Six V-12 with a displacement of 702 cu in. The engines are of an over-square design and run on regular grades of gasoline. They develop maximum torque at relatively low engine speeds; the 401 develops maximum torque at 1,400 rpm. The six-cylinder engines have 70 interchangeable parts; 50 of the parts are common to all six and twin-six units.—**GMC Truck & Coach Div., General Motors Corp., 660 South Blvd., East, Pontiac 11, Mich.**



Self-Cleaning Bucket

The Shunk-Baker self-cleaning bucket works on the principle of the ice cream dipper. As the bucket dumps, a blade scrapes sticky material from its interior. The bucket is available in 1, 1½, 2 and 2¼ cu yd sizes.

The alloy steel scraper blade is ⅝ in. thick and operates on steel bushings. The scraper is chain-driven and spring-loaded. It cannot be damaged by rocks or other hard objects. A flush-mounted cover plate protects the actuating gear and drive chain.—**Shunk Mfg. Co., Bucyrus, Ohio.**

Horizontal Auger

A horizontal auger that drills holes and installs pipe up to 48 in. in diameter and 125 ft in length is capable of boring through solid rock formations.

The Compton auger weighs approximately 9,500 lb. A 73-hp engine powers the unit. It has a direct gear drive and a hydraulic feed. The cutting head consists of saw-teeth with carbon steel tips that turn clockwise.—**Compton, Inc., Clarksburg, W. Va.**

PRECAST SLABS HANDLE EASIER

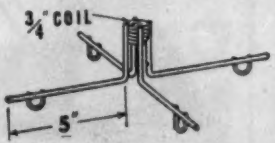
.....with Dayton Sure Grip Accessories

Safer, More Economically Too!

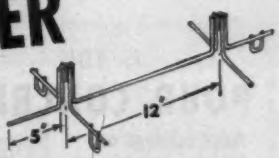
No doubt about it, when precast slab accessories are engineered specifically for a given job, they'll do the job easier, safer and more economically. The Dayton Sure Grip accessories shown here are standard items. They may be right for your job, but if not, our engineering and drafting departments will design the product that fills your specific needs or specifications.

You can avoid lost time and damaged slabs when you use the services of Dayton Sure Grip and Shore Co.

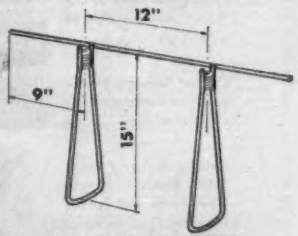
These accessories are made in a full range of sizes, accommodating up to 1½-inch coil bolts.



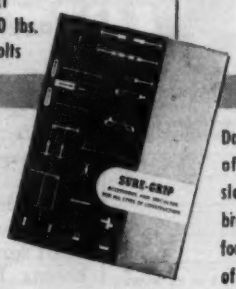
Type 1 SINGLE PICK UP INSERT
Safe loads up to 9000 lbs. P.S.I. with 1½-inch bolts



Type 2 DOUBLE PICK UP INSERT
Safe loads up to 12000 lbs. with 1-inch bolts



Type 3 DOUBLE LOOP INSERT
Safe working loads in shear up to 6000 lbs. with 1-inch bolts



THE DAYTON SURE-GRIP & SHORE CO.

113 KERCHER ST., MIAMISBURG, OHIO

Dayton Sure Grip has a complete line of precast accessories including slotted studs, lifting anchors, slab braces, screw anchors and bolts. Write for our FREE catalog and the name of your nearest Sure Grip dealer.

INDIAN

DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular. Send for circular.

SMITH
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No. 22GO BANNER
SPRAYER
Capacity 4 Gals.

For spraying Silicon water repellents for masonry work and many other spraying purposes. Finest compressed air sprayer built. Send for catalog on complete line. Discounts in Quantity Lots.

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EQUIPMENT NEWS... *continued*

Power Steering for D8

All Caterpillar D8 tractors, prior to 14A models, may be equipped with Rivinius Live Power Steering. A steering clutch changeover is no longer necessary in this improved steering system. The attachment transfers complete clutch control to fingertip levers. The tractor can be stopped instantly by pulling back both hydraulic control knobs. Releasing the knobs return them to the engaged clutch position.

This is a hydraulic steering system that consists of a double hydraulic cylinder connected to both steering clutch adjusting rods, a control valve, Vickers hydraulic pump, reservoir, hoses, brackets, and hardware. Field installation is relatively simple.—**Rivinius, Inc., Eureka, Ill.**

Crane Lifts 125 Tons

The largest crane of the Manitowoc line—the new model 4000—is capable of lifting 125 tons at a 17-ft radius. It has a "T" section boom with a basic length of 70 ft.

For longer reaches boom inserts are available in 10, 20, and 30-ft lengths. Extra long tubular booms handle maximum reach,

"AIR KING"

FOR *Quick, Pressure-Proof Connections* ON AIR HOSE AND COMPRESSORS...

"Air King" Quick-Acting, Universal Type Coupling. Built on plain, rugged lines to assure long trouble-free service under all conditions. Locking heads identical for all sizes of hose or threaded ends within the "Air King" size range. To connect, press together and apply quarter-turn. Reverse to disconnect. Equipped with auxiliary locking device for added safety. Regularly furnished in bronze or rust-proofed malleable iron, but also available in special metals.

Made in Hose Ends and Male and Female I. P. T. Ends, in sizes up to 1".

FOUR-LUG STYLE

Same as above in locking action, but for larger hose sizes. Hose ends and I. P. T. Ends in sizes 1¼", 1½" and 2".

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

DIXON
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GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
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DIXON VALVE & COUPLING CO., LTD., TORONTO, Associate Companies
Rock Iron Company, Inc. | Quarryville, Pa. | Precision Drawn Steel Company, Camden, N.J.

NEW-

Tow it into place

...Weir Contracting Co. tows their Heltzel Unitized, Mobilized Batching plant from previous job site on its own transportation wheels...

Heltzel's new 100 and 150-ton, pushbutton batching plants are now *unitized* and *mobilized* for easier moving—for faster setup—for greater savings of time and money.

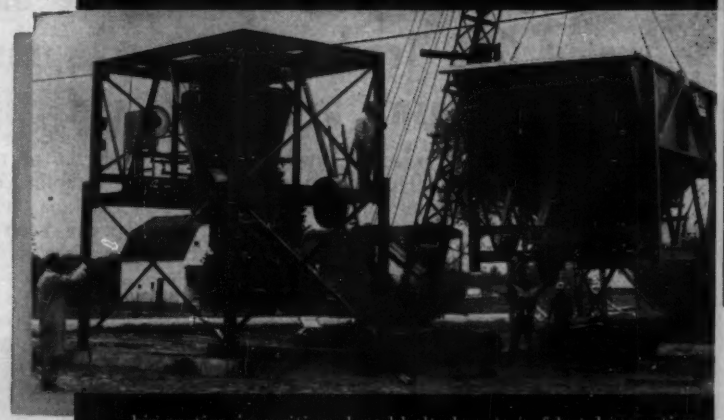
The new plant consists of two self-contained mobile sections; hopper section and batcher section (including scales) with new fold-up supporting columns. Both sections have built-in wheel assemblies and towing tongues—ready to roll.

Weir Contracting Company of Detroit, Michigan reports: "... Our first job was in Greenbrier Meadows Subdivision, Livonia, Michigan. After the plant arrived on the site it was ready for operation in a very few hours. We found that the speed of batching will give two complete batches in thirteen seconds. On subsequent work, the plant was dismantled and ready for transportation in two hours and towed by small, single axle dump trucks to the new location. We have found that the built-in transportation wheels save us over $100.00 a move because of not having to rent trailers."

For complete data and specifications contact your nearby Heltzel representative—or write us direct.

Set it up fast

... batcher section is raised into position, hinged columns are lowered and bolted in place ...

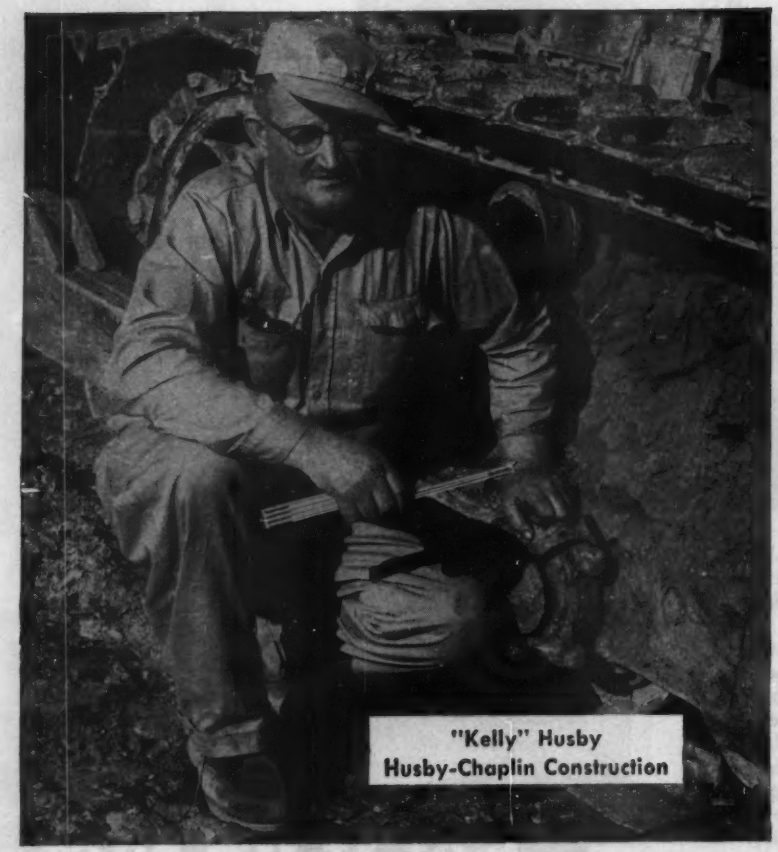


... bin section is positioned and bolted on top of batcher section.

Start batching

In just a few hours this full size, high capacity, pushbutton paving plant is ready to operate!

THE HELTZEL STEEL FORM AND IRON COMPANY
WARREN, OHIO



"Cut track overhaul costs? Sure! We're having our tracks done on a new OTC 'Trackmaster' track press which doesn't broach the pin bosses!"

"We expect about twice as much life out of each set of rails," says Clarence E. "Kelly" Husby, partner in the Husby-Chaplin construction firm in southern Minnesota, "because the OTC 'Trackmaster' hydraulic track press does not ruin the pin bosses, and we can keep rebuilding the rails. And this saves us money! As far as 'downtime' is concerned, there is another saving . . . because we get our tracks done faster, and keep our machines working."

SAVES MONEY IN OVERHAUL

Like contractor "Kelly" Husby, you can save money by having your tracks re-pinned on the new, fast OTC Trackmaster press. Ask your track repair man.

Write for additional information on OTC's new "Trackmaster" hydraulic track press:

RESEARCH · ENGINEERING · DEVELOPMENT

OTC

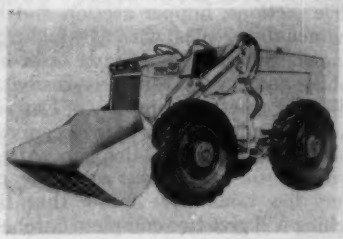
OWATONNA TOOL COMPANY

380 CEDAR STREET OWATONNA, MINNESOTA

light weight lifting jobs. In addition to the tubular boom there is a 50-ft light capacity jib. A 30-ft long 15-ton capacity sectional jib is optional. This can be extended to 40 ft at a rated capacity of 10 tons.

The machine rides on crawlers 21 ft 10 in. long with 48-in. treads. Overall width is 18 ft 6 in. The crane weighs approximately 265,000 lb. It can be loaded on a standard flat car without extensive dismantling.

A choice of diesel engines, torque converter, and self-removing counterweight are standard. Optional equipment includes independent boom hoist and swing, high capacity gantry, automatic and pantograph boom stops, and manual or air controls. — **Manitowoc Engineering Corp., Manitowoc, Wis.**



Five Different Buckets Fit New Tractor Loader

The Allis-Chalmers TL-16 TractoLoader handles five buckets ranging in size from 1½ to 4 cu yd. The loader weighs 18,000 lb: its carry capacity is 7,000 lb.

The buckets tip back 40 deg at ground level. The carry height is 14 in.; at that height the buckets tip back 45 deg. Depending upon the bucket size, dumping clearance under the cutting edge ranges from 8 ft ½ in. to 9 ft 3 in. Reach from the front tires to the cutting edge ranges from 2 ft 6 in. to 3 ft 3 in.

A 109-hp Hercules gasoline engine or a 104-hp Allis-Chalmers diesel powers the loader. Top travel speed in either forward or reverse is 27 mph. A single stage torque converter is standard.

The loader has rear-wheel power steering and four-wheel power brakes. In addition, there is a separate mechanical parking brake. The automatic clutch cut-off transfers full engine power to the hydraulic system at the touch of the brakes. — **Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.**

J-M Friction Material Technical Bulletin #110:

How to pick friction materials to get best performance from Drag Lines

A recent industry survey shows that 25% of the average contractor's bid price represents the cost of equipment maintenance.

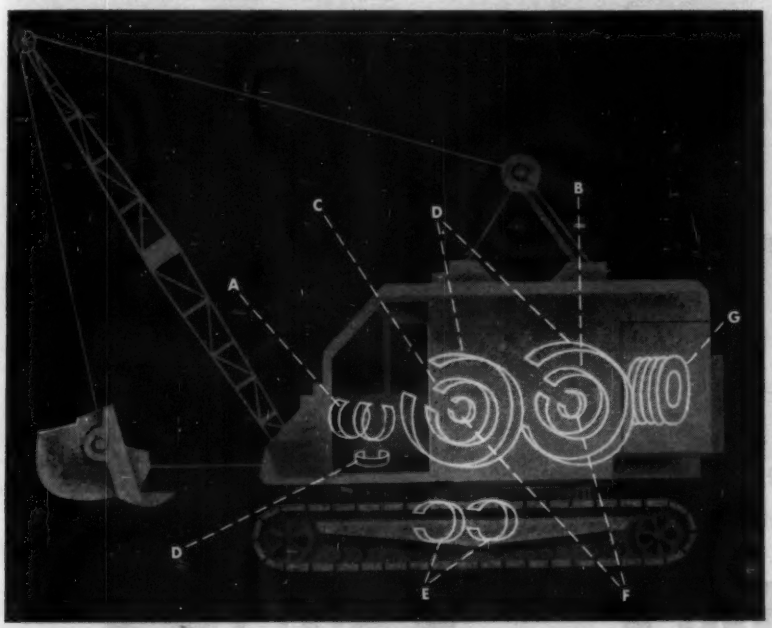
Here's an obvious area of opportunity for you to convert costs into profits through good maintenance practices. And since improper friction materials cause over half the premature failures in relined brakes and clutches—picking the right lining or facing should be the basic requirement of any maintenance plan.

As shown in the accompanying diagram of drag line shovel requirements, it is the mechanism's work load that determines the characteristics of the controlling friction.

For example—for the swing friction which controls the momentum of the heavy cab and boom—you need a special material like J-M 150 to absorb the high torque effect. The engine clutch, on the other hand, receives sudden high rpm loadings, and requires a material like J-M 140 to withstand extreme thermal exposure.

To meet modern equipment requirements such as these, Johns-Manville Asbestos Frictions are supplied in two different primary classifications—molded and woven—with numerous style variations in each. The Molded Asbestos styles resist thermal breakdown and withstand heavy shock loads which tend to crush or shear materials. The Woven Asbestos styles—with easy adaptability and quick wear-in—have exceptional non-scoring properties and mechanical strength. All assure more service hours per dollar invested.

For expert counsel and advice on your friction needs, call on your nearby J-M Friction Materials Specialist. And for your own FREE copy of the J-M Industrial Friction Materials book—a comprehensive listing of types, styles and recommendations—write Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario. Ask for FM-35A.



Recommended J-M Friction Materials for Drag Lines

A. Swing Friction—subject to extreme wear and high torque.—J-M 150 for high energy absorption, good rate of wear and non-fade characteristics.

B. Hoist Friction—receives heavy wear. Extreme loads require easy engagement and positive, non-slip holding—J-M 140 for excellent wear characteristics and non-fading friction.

C. Drag Friction—subject to high impact and variable loading—J-M 150 for high friction, and excellent frictional stability over wide temperature range.

D. Swing Brakes, Hoist Brakes, Drag Brakes—swing and hoist brakes are exposed to sudden shock loads while drag brakes receive intermittent loading.

—J-M 600 for easy seating, long wear and excellent holding characteristics.

E. Travel Brakes—most units require exceptionally long lining with good holding power.—J-M 300 or 600 Woven Roll Stock for ease of application.

F. Boosters—utilized on most equipment to assist mechanisms exposed to extreme loading or high torque conditions. Usually found next to mechanism they assist, boosters require a friction material that is fast seating and gives positive engagement.

—J-M 300 and 600 Woven Roll Stock for ease of application and size variety.

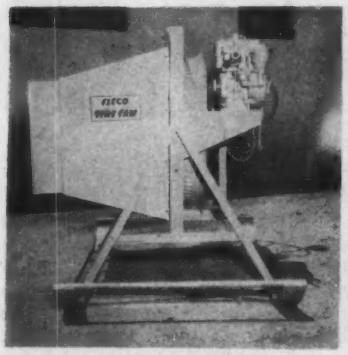
G. Engine Clutch—exposed to intermittent high torque, sudden shock loads and heat surge.

—J-M 140 for its ability to quickly dissipate heat and withstand shock loads, and its high friction stability.

Molded J-M Facing Segments being riveted to a swing friction member.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS



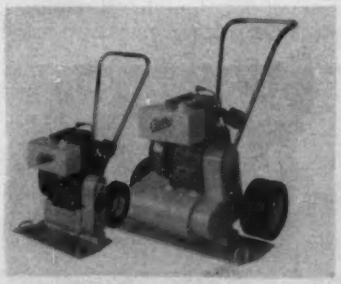
Fan Fires Debris

This fan helps burn piles or windrows of brush and debris by forcing large volumes of air and a spray of fuel oil on to the burning material.

The Fleco FFP fire fan is rated at 12,000 cfm. A 24-in., six-blade fan produces air velocities of up to 32 mph. Adjustable vents permit the full flow of air to be directed to a specific area.

A 3-hp Briggs & Stratton air-cooled engine powers the fire fan. A self-priming pump sprays fuel oil into the air stream for more efficient burning. A nozzle and a 21-ft hose insure safe placement of the fuel supply. A single throttle and spray valve control the operation.

The fan is skid mounted for towing. It can be mounted on a jeep or a truck for greater mobility.—**Fleco Corp., P. O. Box 2370, Jacksonville, Fla.**



Power Tampers

Two power tampers have shoe widths of 18 and 30 in. The Kelley tampers can be used on granular soils as well as bituminous material. Gasoline engines drive both models. Exhaust heater shoe attachments are available for both units for use on asphaltic mixes. The tamping rate is 2,400 cycles per minute. — **Kelley Machine Div., Wiesner-Rapp Co., 285 Hinman Ave., Buffalo, N. Y.**

Filter Cleans Air By Separation

This filter removes moisture, oil, and other contamination from compressed air by separation rather than absorption. The Fram FBM 1900-PL filter can be installed easily and may be used at pressures up to 125 psig. It is rated at 20 scfm and has a very low initial pressure drop.

Accumulated water and oil can be drained off periodically through a drain cock at the bottom of the filter. The C1900-PL cartridges can be changed when necessary.—**Fram Corp., Providence 16, R. I.**

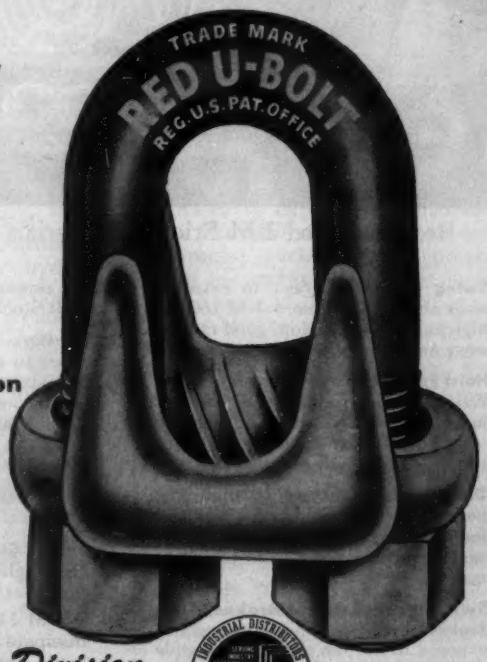
For SAFER wire rope fastenings . . .

GENUINE

CROSBY WIRE ROPE CLIPS

Red U-Bolt* for instant recognition

- **Drop forged base**
- **Base grooved to fit rope**
- **Hot-dip galvanized . . resists rust and corrosion**
- **Standard heavy hex nuts**



Write for free specifications catalog listing the most complete line of drop forged fittings for wire rope and chain.

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Stocked by leading distributors everywhere.

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OLIVER

Sanfilippo's OC-4 with 72½" dozer does it all—land clearing, assists in basement digging, back filling, final grading on this commercial building job.

"My OC-4 with 'Spot-Turn' saves me 2 hours in 8!"

Jack Sanfilippo is a keeper of accurate records. As owner of his own excavating company in Keyport, N.J., he finds it pays to be. The facts prove that with his OC-4 he can now do in six hours what took eight with an older tractor not having the OC-4's "Spot-Turn" steering advantages.

That's a 25% gain in production and profits—just by the addition of *one* OC-4. Splendid close-quarter maneuverability with shortest turn-around radius accounts for most of it—with the OC-4's higher measure of diesel power doing the rest. Not only that, but Sanfilippo's earnings are even greater when you consider his unbelievably low fuel operating cost—just $7.65 for a 40-hour week!

Come see...come try the OC-4 for yourself—the compact, big-job tackler that's *first* in its crawler class for drawbar pounds pull and *lowest* in its class for price!

THE OLIVER CORPORATION
Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio
a complete line of industrial wheel and crawler tractors and matched allied equipment

Here's the new look in tractor catalogs: the all-new OC-4 bulletin. It's heavy on job-application pictures and data...shows the OC-4 tooled-up with a dozen different work-speeding, income-boosting equipment changes! It's sound business reading that carries a rewarding message for any tractor user. Mail coupon.

Ask your Oliver Distributor for a demonstration of the OC-4's work power

Please send a copy of your new 16-page, color catalog on the OC-4 tractor. T29-9

Name.....
(Please print)

Company.....

Address.....

City.....*Zone*.....*State*.....

JOB RECORDS PROVE

Firestones keep tire costs down!

Count on Firestones to reduce your hourly costs—no matter where you work 'em! Every Firestone is job-engineered to match the punishment of the toughest jobs. They're built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires! Exclusive Firestone S/F (Shock-Fortified) nylon or rayon bodies shrug off bruising shock and impact. Specially designed Firestone treads and sidewalls roll through conditions that often ruin ordinary tires. Call your Firestone Dealer or Store and ask about the full line of Firestone tubeless or tubed off-the-highway tires. He'll recommend the tires that are built for your job! And, remember, Firestone off-the-highway tires are backed with on-the-job service!

Rock Grip Excavator Wide Base

Rock Grip Excavator

When ordering new equipment always specify Firestone tires—available tubeless or tubed.

Firestone

BETTER RUBBER FROM START TO FINISH

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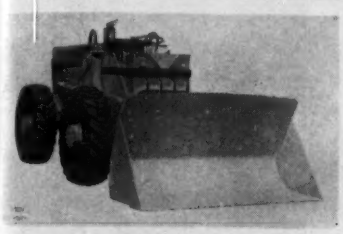
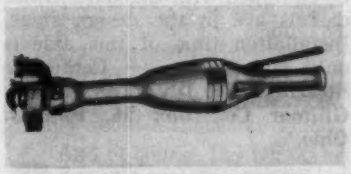


Maneuverable Shovel

Four-wheel drive, hydraulic power steering, full power shifting, and a traction differential make this Trojan 204 tractor shovel a highly maneuverable unit. The differential is designed to transfer power to the wheel with the best traction. The unit has three speeds in both forward and reverse. Travel speeds range from 3 mph in low gear to 21 mph in third gear.

The maximum lifting capacity is 12,000 lb. Bucket capacities are 1½, 2, and 2¾ cu yd. Dumping clearance under the bucket cutting edge is 8 ft 7 in. At this point the dump angle is 47 deg.

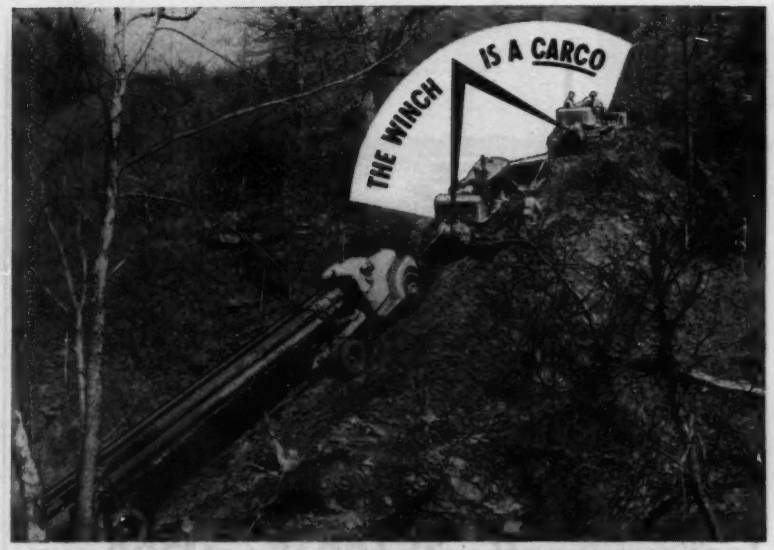
The front bumper is an integral part of the frame. Front lights are recessed in the hood for protection from falling debris. Panels in the hood shroud are removable for access to the engine and battery compartment. All gages are grouped on a panel, and the operator has 360-deg visibility during operation.—**The Yale & Towne Manufacturing Co., Trojan Div., Batavia, N. Y.**



Wire Brushing Machines, Grinders, and Buffers

Horizontal grinders, horizontal buffers, and wire brushing machines constitute the 902 series of new 4-in. portable pneumatic grinders. All units are available with straight, lever, or grip-type handles.

Grinders and wire brushing machines come with speeds of 7,200, 9,000, and 12,000 rpm. The horizontal buffers have two speeds of 9,000 and 12,000 rpm. Spindles on the buffers are 1 in. longer than those of the grinders.—**Thomas C. Wilson, Inc., Long Island City, N.Y.**



CARCO WINCHES LICK 65° GRADE ON "WILDERNESS ROAD" PIPELINE

Key equipment in building a 36-mile natural gas pipeline from Osborn Gap, Virginia, to Maytown, Kentucky, were 9 Carco-winch-equipped Allis-Chalmers tractors.

Called Wilderness Road, the line was a tough assignment, as solid rock and grades up to 65 degrees were encountered in crossing the mountains of Virginia and eastern Kentucky.

On this job, as on most pipeline projects, Carco winches were found invaluable in helping complete the work on schedule. Some of the important tasks for which the contractor, H. B. Ranier Construction Company of Prestonburg, Kentucky, depended upon Carco winches were towing costly, heavy equipment such as loaded pipe trucks, ditchers, backhoes and welders up steep grades and holding them on down slopes.

All 9 Carco winches were either Model FO or Model GO. Both are specifically designed for pipeline and oilfield work. Both offer contractors two forward speeds and reverse, automatic brakes, constant mesh gear trains and other features, many exclusive with Carco.

Carco makes more winches for more makes and models of industrial tractors than any other producer. That's conclusive evidence that Carco winches are designed to perform efficiently and built to withstand the rugged service to which they are subjected. For your next winch, be sure to see your nearest Carco dealer. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.

SPECIFICATIONS
CARCO FO Winch
Cable Drum Sizes:
Barrel diameter ..... 8"
Flange diameter..... 19"
Barrel length..... 15"
Drum Capacity (calculated):
¾" wire rope..... 746'
⅞" wire rope..... 518'
1" wire rope..... 390'
1⅛" wire rope..... 292'
Line Pull, Bare Drum:
To 50,000 lbs. depending on tractor horsepower.
Shipping weight—1,590 lbs.

SPECIFICATIONS
CARCO GO Winch
Cable Drum Sizes:
Barrel diameter ..... 8"
Flange diameter ..... 22"
Barrel length ..... 13"
Drum Capacity (calculated):
¾" wire rope..... 658'
⅞" wire rope..... 482'
1" wire rope..... 371'
1⅛" wire rope..... 293'
Line Pull, Bare Drum:
To 60,000 lbs. depending on tractor horsepower.
Shipping weight—2,425 lbs.

Carco is a pioneer maker of tractor winches. From the first, Carco winches have been built to give such lasting efficiency they have earned an international reputation for dependability.

CARCO

Jaeger pays off with 600 cfm at 1700 rpm

This Jaeger rotary compressor, powered with the same GM 6-71 diesel used in other makes, produces 600 cfm of air with 100 fewer revolutions (1700 rpm instead of 1800), *consuming less than 1¼ lbs. of fuel.* Think of the long-term saving in fuel, and engine and compressor life. Other Jaeger sizes are comparably efficient. See your Jaeger distributor, or send for Catalog.

The Jaeger Machine Company, 800 Dublin Ave., Columbus 16, Ohio

LOW COST POWER
for WRECKING-SMASHING
FREDERICK CAST Semi-Steel
DROP BALLS

Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting . . . deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstands greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloys furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.

Wide range of sizes and weights!							
Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.). (for magnet use)	470	950	1650	2400	3000	3700	5400

Write us today for prices and illustrated literature; order Balls direct or see your nearest Equipment Dealer.

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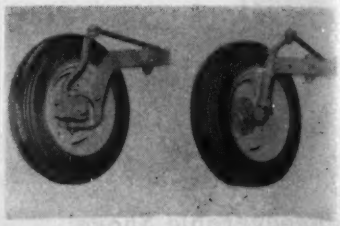
Makers of Manhole Frames, Covers and Steps • Storm Gratings
Meter Frames and Covers • Centrifugal Pumps • Grey Iron Castings



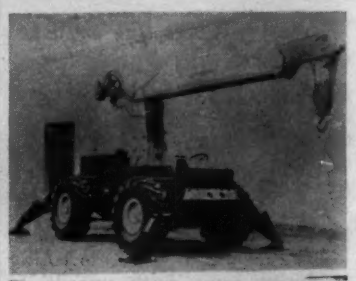
Centerline Steering Axle Now Fits Wheel Tractors

A new type of steering axle carries all forces in a vertical action through the centerline of the wheel and the tire (left). The front wheel has zero camber and zero toe characteristics.

In this axle the hub is not a part of the wheel. Instead, it is mounted in two spherical bearings in a yoke at the end of the axle. It does not rotate. But the wheel spindle is an integral part of the wheel and does rotate. There is no kingpin.

The manufacturer claims that this axle makes steering easier and that power assists are unnecessary. The design is simple and rugged. These axles can carry as much as 18,000 lb.

The "I.G." Centerline Steering Axle has been in production for some time and is in use in the trucking industry. It is now being made available as a replacement conversion unit for tractors. Ford tractors with wide front axles from 1948 to 1959 models can now be equipped with this axle. Other models are in the design stage. Installation time of this axle is only 60 minutes. — **Centerline Steering Axle Div., The Paul M. Gillmor Co., Box 56, Findlay, Ohio.**



Materials Handling Crane

The boom on the Austin-Western 410 crane rises 60 deg from the horizontal and rotates through continuous circles in either direction without limit stops. The 15-ft boom has a 10-ft telescoping

CAN YOUR PLANT BIG AS IT MAY BE —

PRODUCE AS MUCH CONCRETE AS THIS?

This BUTLER Central Mixing Plant is simply the extremely portable HP-85 Ready Mixed unit with an additional section to accommodate two turbine-type, high speed concrete mixers.

Production? In excess of 200 yards an hour!

The batching cycles are completely automatic; only one man operates batchers and mixers.

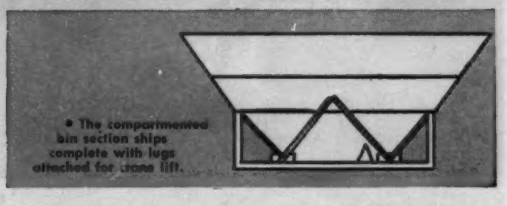
Where such capacities are not required, the BUTLER HP-85 can readily be built for a single turbine mixer.

The HP-85 is ideal for fast, efficient, low-cost batching in commercial ready mixed operations as a permanent plant — or as a unit that can be moved quickly and economically from job site to job site. The cost of erecting is only about a thousand dollars.

And of course, the HP-85 brings all its benefits to pre-cast and pre-stressed concrete operations.

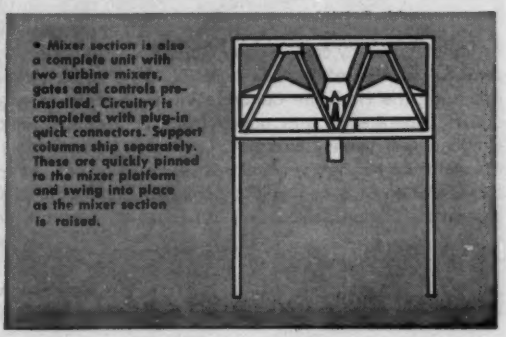
Due to the BUTLER HP-85's remarkable portability, a growing number of ready mixed operators are using it to enter the Highway Program — using either agitating or non-agitating trucks.

What are *your* plans? In any case, plan for the profit-making BUTLER HP-85.



• The compartmented bin section ships complete with lugs attached for crane lift.

• Batcher section is a complete unit with all piping, wiring, batchers and automatic controls in-place, ready for plug-in.



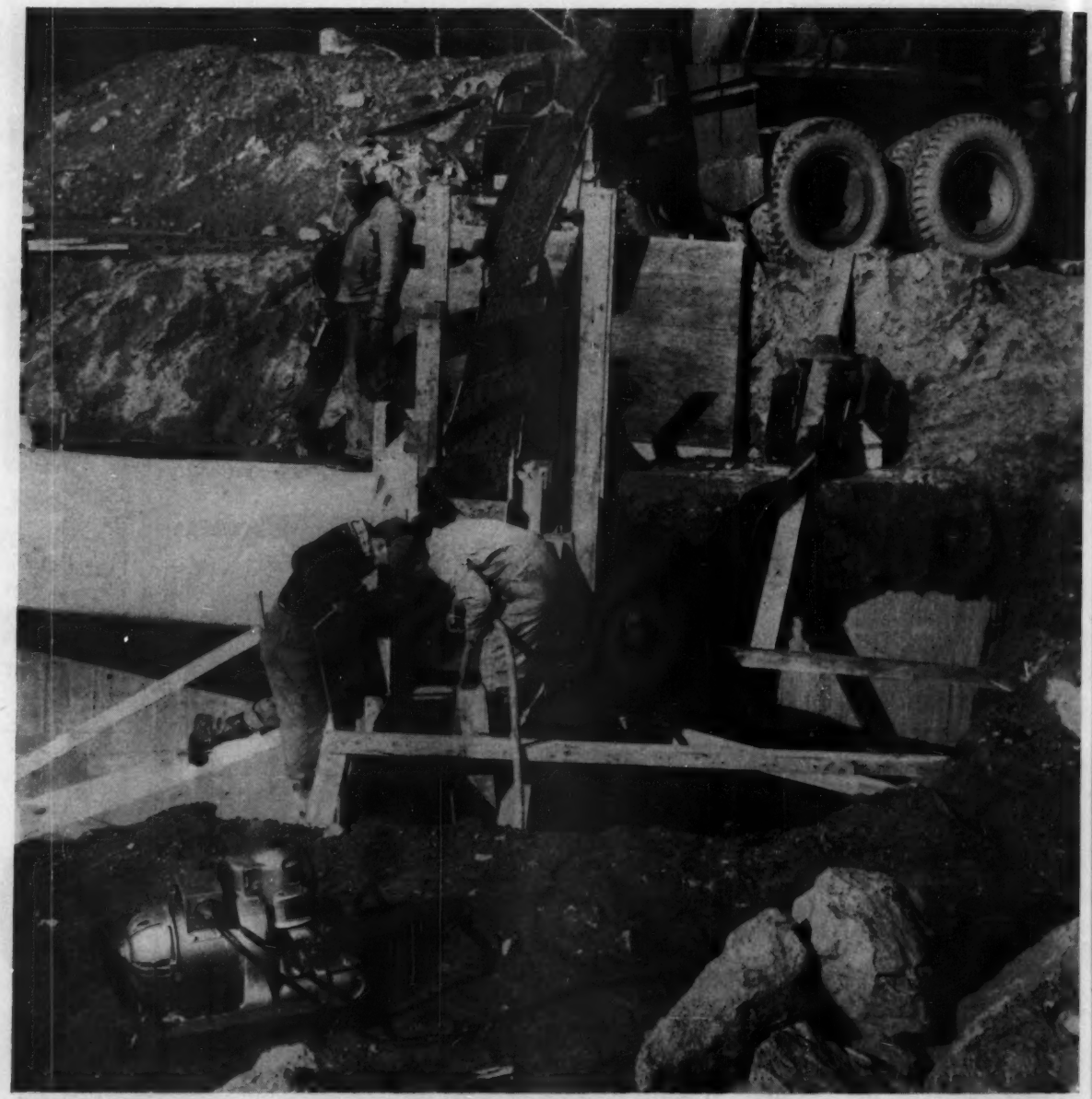
• Mixer section is also a complete unit with two turbine mixers, gates and controls pre-installed. Circuitry is completed with plug-in quick connectors. Support columns ship separately. These are quickly pinned to the mixer platform and swing into place as the mixer section is raised.

Here's the reason the HP-85 is erected at lowest cost . . . in hours instead of days

You'll want to know more about the BUTLER HP-85. Send for this illustrated Bulletin. Just write "HP-85" with your name and address on a postcard. We'll do the rest — promptly!

BUTLER BIN COMPANY

949 BLACKSTONE AVE. • WAUKESHA, WIS.



USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

How contractors cut costs

The picture tells the story . . . an interesting story to any cost-minded contractor. Look at it carefully. One man . . . is operating the Homelite Concrete Vibrator. He operates it with power from a Homelite Carryable Generator. Look at the picture again. The generator is set up for operation in a convenient spot. No special scaffolding is necessary. No extra expense involved. It's savings all along the line . . . savings in time, labor, and work. And it's savings with a bonus. Other men can use the generator at the same time to operate standard universal power tools or brilliant floodlights.

Ask for free on-the-job demonstration of how to save with Homelite Concrete Vibrators and Carryable Generators.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE
CARRYABLE
Concrete **VIBRATOR**
PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

HOMELITE • A DIVISION OF TEXTRON INC., 1009 RIVERDALE AVE., PORT CHESTER, N. Y.
In Canada — Terry Machinery Co., Ltd.

Trencher for IH Tractors

A variable hydraulic drive on this trencher automatically adjusts the forward speed of the tractor to compensate for changing soil conditions. A digging ladder with alternate right and left cutting teeth cuts the trench and lifts the dirt to ground level where augers convey it to both sides of the trench.

The Auburn Gear - Draulic Trencher is designed for International Harvester 340 and 460 utility tractors. It digs trenches from 6 to 14 in. wide and up to 6 ft deep. Interchangeable digging chains and booms are available to accommodate various widths and depths of trenches. Special bits are available for use in rock, shale, and frozen ground.—**Auburn Machine Works, Inc., Auburn, Neb.**

Motor-in-Head Vibrator

High amplitude and a speed of over 10,000 vibrations per minute are features of the Stow Hy-Cycle motor-in-head vibrator. It operates from a 230-volt, 180-cycle, three-phase generator. There are no brushes or commutators in the head.

The unit is available with two different size vibrator heads. The 1¾-in. head is 20¾ in. long; the 2⅜-in. head is 19¾ in. long. A waterproof on-off switch is located 7 ft from the head. The flexible, four-ply handling casing is available in lengths of 7 ft, 14 ft, and 21 ft. A 25-ft electric cable plugs into the generator. Shifting the throttle lever of the generator adjusts the vibrator's speed. A four-cycle, air-cooled gasoline engine powers the generator. The Hy-Cycle vibrators also can be furnished with 110-volt, 180-cycle, three-phase windings.—**Stow Manufacturing Co., 31 Shear St., Binghamton, N.Y.**

model H-50 PAYLOADER®

with 5000 lb. carry capacity

The model H-50 is the successor to the model HU in the "PAYLOADER" line of 4-wheel-drive tractor-shovels, and is another example of the continual development program that has maintained Hough leadership in tractor-shovel design and performance. It contains a number of improvements that give it outstanding performance for a machine in this size range.

MORE POWER The H-50 gives you a choice of gasoline or diesel engines, and more horsepower in both types — 92 hp gasoline, 90 hp diesel. These bigger engines provide more power for both propulsion and hydraulics without "lugging down".

EASY, FULL-POWER OPERATION Power-shift transmission with three speeds forward and reverse, plus easy power-steer and 4-wheel power brakes assure fast operation with minimum operator effort . . . promote a high production rate the full shift.

PROTECTED FOR LONG LIFE Sealed front brakes, complete filter protection for engine and hydraulic systems, hypoid differential with power-transfer feature, and planetary final drives are some of the many design details that will assure low maintenance, reliable service and long life.

MORE ATTACHMENTS . . . MORE USES The widest choice of attachments are available, including these exclusive ones: Drott 4-in-1 bucket, Wain-Roy Back-hoe, Vibratory compactor, Ram Black-top spreader . . . also blower, "V" and blade plows, angling back-filler, back-rip scarifier, winch and others.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
706 Sunnyside Ave.,
Libertyville, Ill.

☐ Send data on H-50 "PAYLOADER".

☐ Other "PAYLOADER" units to 12,000-lb. carry cap.

Name _____
Title _____
Company _____
Street _____
City _____ State _____

9-8-2

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CONSTRUCTION CASTINGS OF

★ SOUND QUALITY
★ SUPERIOR FINISH
★ SOLID VALUE
DELIVERED ON TIME

Patterns on hand for over 15,000 different Gray Iron and Ductile Iron construction castings.

Write for our new 165-page completely illustrated catalog.

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EQUIPMENT NEWS...*continued*

extension. All boom operations are hydraulic.

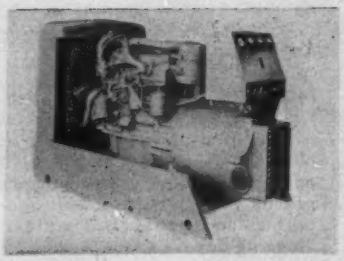
With the hydraulic outriggers in the down position, the crane has a capacity of 10 tons at a radius of 10 ft. Without outriggers it can handle 14,250 lb at any point of the compass at a radius of 10 ft.

Either gasoline or diesel engines are available for this crane. It has four-wheel power steering, a two-wheel drive, and a torque converter transmission. Top speed is 23 mph.

Optional equipment includes a heated cab, clamshell bucket, post hole auger, remote control maintenance platform, and manual boom extensions.

Also available is a three-wheeled crane with three different boom options. Capacity of the 110 crane is 5 tons. The three-wheel chassis consists of dual front driving wheels and a single rear power booster wheel. The trunnion-type rear wheel steers the unit. Maximum speed is 15 mph.

A completely hydraulic swing mechanism rotates the boom through 220 deg. Maximum elevation of the boom is 50 deg. Boom lengths range from 7 to 13 ft. with an optional manual extension that extends the boom to 18 ft 7 in.— **Austin-Western, Box 243, Aurora, Ill.**

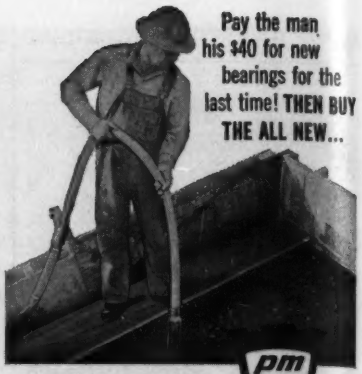


Big Diesel Electric Plant

A 25,000-watt Onan diesel electric plant is rated at 31.25 KVA at 0.8 power factor. The series DZC generating plant is available in standard voltages up to 460 volts.

A water-cooled, four-cylinder Hercules diesel powers the unit. The DD-226 engine develops 60 hp at 1,800 rpm.

Optional accessories include a weatherproof housing, a meter panel with instruments, and an underground fuel tank and fuel lines with fittings. — **D. W. Onan & Sons Inc., 2515 University Ave. S.E., Minneapolis 14, Minn.**



SOLO CONCRETE VIBRATOR

The only NEW DEVELOPMENT IN CONCRETE VIBRATORS IN 25 YEARS! 25,000 V.P.M.—"higher than hi-cycle"—this one man tool saves you $25 per day. It eliminates eccentric bearings and puts the $40.00 per 100 hours you normally pay for bearing replacement *right back in your pocket.*

Write for free demonstration. There's a PM Field Engineer near you.

Pacific Mercury
14052 Burbank Blvd.
Van Nuys 3, Calif.
Manufacturers of the Thomas Electronic Organ

NEW 3/4-ton Pull-A-Way
Added to WRIGHT TYPE "C" LINE!

FOUR SIZES • ¾, 1½, 3 and 6 Tons

FEATURES
• Lubricated for life
• Hooks are drop-forged
• Special alloy-steel chains
• Chain sheaves of drop-forged alloy steel
• Gear teeth cut to precision limits
• Load brake is dependable and safe
• Weights:
¾-ton, 14 lbs.
1½-ton, 23½ lbs.
3-ton, 36½ lbs.
6-ton, 63 lbs.

New 3/4-ton model
• VERSATILE
• LIGHTWEIGHT

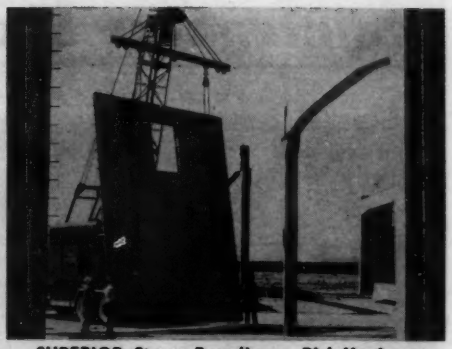
ACCO

Write to York, Pa., office for complete information

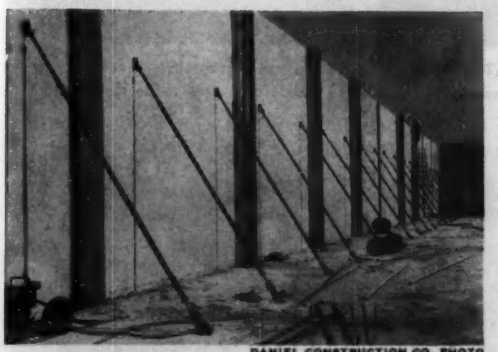
Wright Hoist Division
AMERICAN CHAIN & CABLE
York, Pa., Bridgeport, Conn.

WAREHOUSE

DANIEL CONSTRUCTION CO. PHOTO



SUPERIOR Stress Equalizers, Pick-Up Inserts, and Lifting Angles were used on this panel.



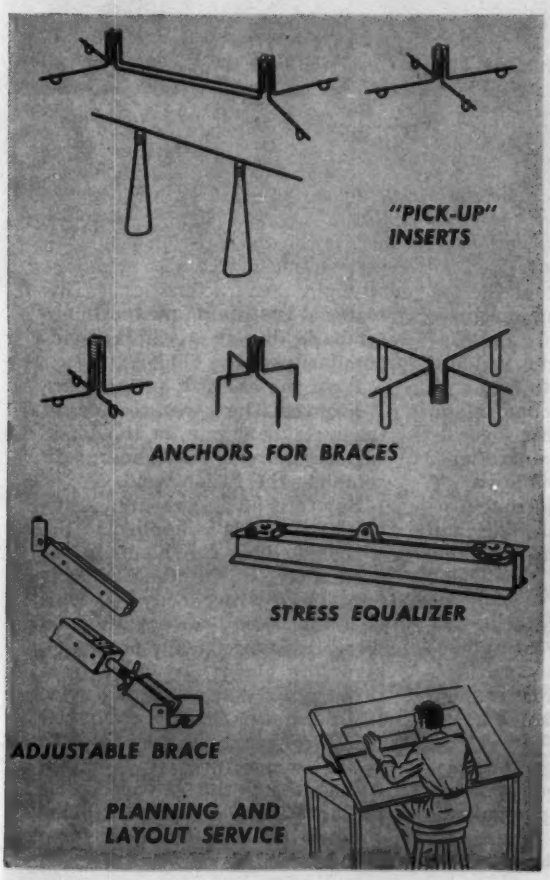
DANIEL CONSTRUCTION CO. PHOTO

ADJUSTABLE BRACES used for quick and easy alignment of panels

SUPERIOR

Has the Accessories AND the System for TILT-UPS . . .

FROM ORIGINAL LAYOUTS TO FINAL POSITIONING



In addition to tilt-up accessories which have been used and proven on thousands of conventional as well as unusual projects in this field, SUPERIOR also provides the *system* for the entire job, from original planning and layouts, to the final positioning of the precast panels.

As the pioneer in this field, SUPERIOR has recently developed a special Stress Equalizer for reducing lifting stress in tilt-up panels of over 20 ft. high. It offers two advantages: (1) Less concrete reinforcing steel is required for stresses which occur at time of lift; (2) Permits use of simplified crane rigging.

On your next tilt-up job, avoid expensive crane delays, be assured of safety, and reduce overall costs! Specify the SUPERIOR System.

For details request a copy of Bulletin TU-3.

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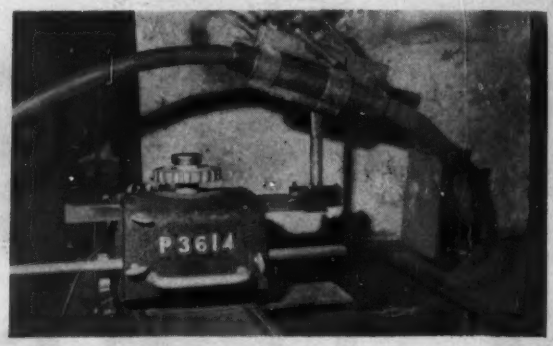
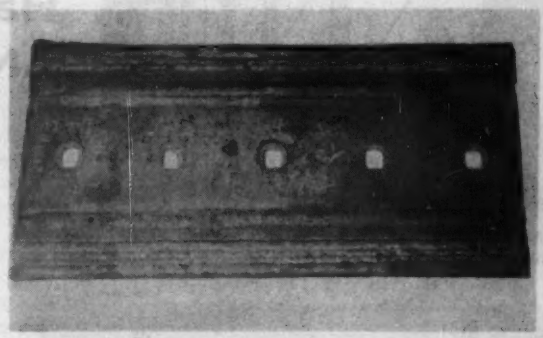
Houston Office:
4101 San Jacinto, Houston 4, Texas

IN POSITION — Rebuilt blade is clamped on table during hard-facing. Shield around weld zone keeps stray metal from rails.



AUTOMATIC RIG — Converted cutting machine rides set of rails and carries semi-automatic nozzle over area to be hard-faced.



REBUILT BLADE — Center section is salvaged core from old blade. Strips of plate welded to core restore blade's original size.

Rig Rebuilds Blades In Just One Hour

LESS THAN ONE HOUR is all it takes to rebuild and hard-face a 5-ft scraper blade.

The maintenance department of an Arizona contractor has developed a special rig to rebuild and hard-face blades automatically; it cuts welding time 75%.

Kleck Custom Tillage of Phoenix is engaged in earthmoving and grading work for agriculture and industry. They probably use as many scraper and grader blades as anyone in Arizona, and their maintenance department is busy rebuilding these blades as they become worn out.

Hard-facing the cutting edges of scraper blades is old stuff to Kleck. At first, they applied hard-facing by the slow manual method. Then, they turned to faster, easier, semi-automatic welding. Even this wasn't fast enough to keep up with the work that poured in from the field.

So they built the special rig. Nucleus of this rig is the semi-automatic machine. Willard Ellison, a veteran welder in their own shop, fabricated a steel table equipped with hold-down clamps for positioning the blades.

Another component of the rig is a converted cutting machine. It rides on a set of rails and carries the semi-automatic welding nozzle over the area to be hard-faced. A reverse mechanism on the cutting machine carriage allows an uninterrupted arc until the sequence is completed. A shield around the weld zone protects the cutting machine and keeps stray metal from the rails.

Rebuilding a Blade

Field crews are careful to pull worn blades before wear extends to the bolt area. The worn units are returned to company shops where they are flame-cut to straight edges.

After flame-cutting, appropriate sizes of ¾-in. steel plate are also flame-cut to supplement the core and to bring the rebuilt blade up to its normal size.

The steel plate is then welded to the salvaged part. Weld material is Stoody K-2140, a manganese stainless wire with excellent strength characteristics. This material is still on an experimental basis, but it is gaining wide popularity in the field.

First, the areas to be fused are V-grooved. Then, two passes with the welding nozzle on the blade surface and one pass underneath complete the fusion weld.

Before a blade goes into service, hard-facing is applied to the wearing edge. The blade is repositioned on the table and is hard-faced with Stoody 100. This is a high alloy wire with good wear resistance. Such protection gives the blades anywhere from three to six times normal service life, depending on the type of soil being worked.

The whole process — from flame-cutting the salvaged core to hard-facing the finished blade —takes less than one hour for a 5-ft blade.

New!

BOSTON CONCORD IMPERIAL STEAM HOSE with exclusive PATREX TUBE AND COVER plus STAINLESS STEEL BRAID

Two more major product advances by BOSTON establish new standards of performance . . . to meet your most exacting requirements. Here's why they give new Boston Concord Imperial Steam Hose unmatched strength, durability and economy.

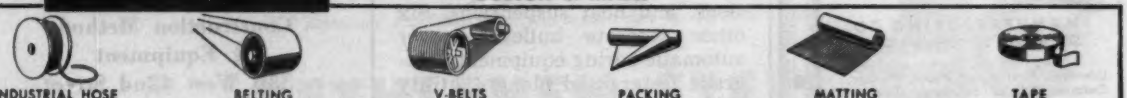
PATREX—is the totally new compound from BOSTON research that gives tube and cover extreme heat resistance, amazing flexibility and increased abrasion resistance. Even at 450° F. Boston Concord Imperial shrugs off hardening and cracking that kills ordinary hose!

STAINLESS STEEL INNER BRAID—can't rust in the bore . . . absolutely protects against tube swelling! Two other steel braid barriers embedded in hose wall reinforce Patrex tube for maximum protection against burst. Completely controls pulsating saturated steam pressures up to 250 PSI!

If you want the best, ask your BOSTON distributor about new BOSTON CONCORD IMPERIAL STEAM HOSE. The new golden cover tells you, "It's the most durable steam hose you can buy!"

BOSTON

BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.



WACO

The COMPLETE, VERSATILE LINE of SCAFFOLDING and SHORING

New Waco accessories and engineering improvements make Waco the most complete and versatile line of equipment available for scaffolding and shoring.

This means one-source convenience and service for YOU. Waco distributors stock sectional steel scaffolding, rolling towers, steel post shores, a complete accessory line, and allied equipment.

For complete information check the yellow pages for your on-the-spot Waco Distributor, or write to

WACO MANUFACTURING CO.
5251 W. 130th St. • Cleveland 30, Ohio

Licensees: Armsen Iron Works, Windsor, Ontario; Tubular Structures Corp. of America, Los Angeles, California

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

NEW EARTHMOVERS—A Caterpillar brochure explains operating features of the newly introduced 619 wheel tractor and 442 Lowbowl scraper. It includes specifications, plus details on steering and braking systems, and safety controls. Another 8-p brochure, "Top Performers," describes three motor graders—the 150-hp turbocharged Model 14, the 115-hp No. 12, and the 75-hp No. 112. "Peak Performance," a third brochure, illustrates dozers, wheel tractors with scrapers and wagons, motor graders, Traxcavators, and power shovels in a variety of earthmoving tasks.—**Caterpillar Tractor Co., Peoria, Ill.**

TRUCK EQUIPMENT — Latest model single and tandem-axle dump bodies, dump trailers, and hydraulic hoists are featured in a new Hercules equipment catalog. It includes dump body and hoist specifications and a series of engineering charts to aid in their selection. — **Hercules Steel Products Co., Galion, Ohio.**

SUBMERSIBLE PUMP — A 4-p folder describes Flygt B-80L, a heavy duty, submersible electric pump that weighs 175 lbs, can handle highly abrasive material, and run dry without damage. Capacity of the 3-in.-discharge pump is 300 gpm at 25-ft head or 70 gpm at 150 ft. The folder contains capacity curves and details design and accessories. — **Stenberg Mfg. Corp., Hoosick Falls, N. Y.**

PAVING EQUIPMENT—A bulletin describes Flex-Plane's combination finisher-float, with specifications. The gas electric drive with separate traction and screed-drive motors and controls is explained. The bulletin illustrates rear screed suspension and extensions, and float suspensions. Six other separate bulletins cover automatic curing equipment, subgrade testers and planers, utility bridges, a gas electric finisher,

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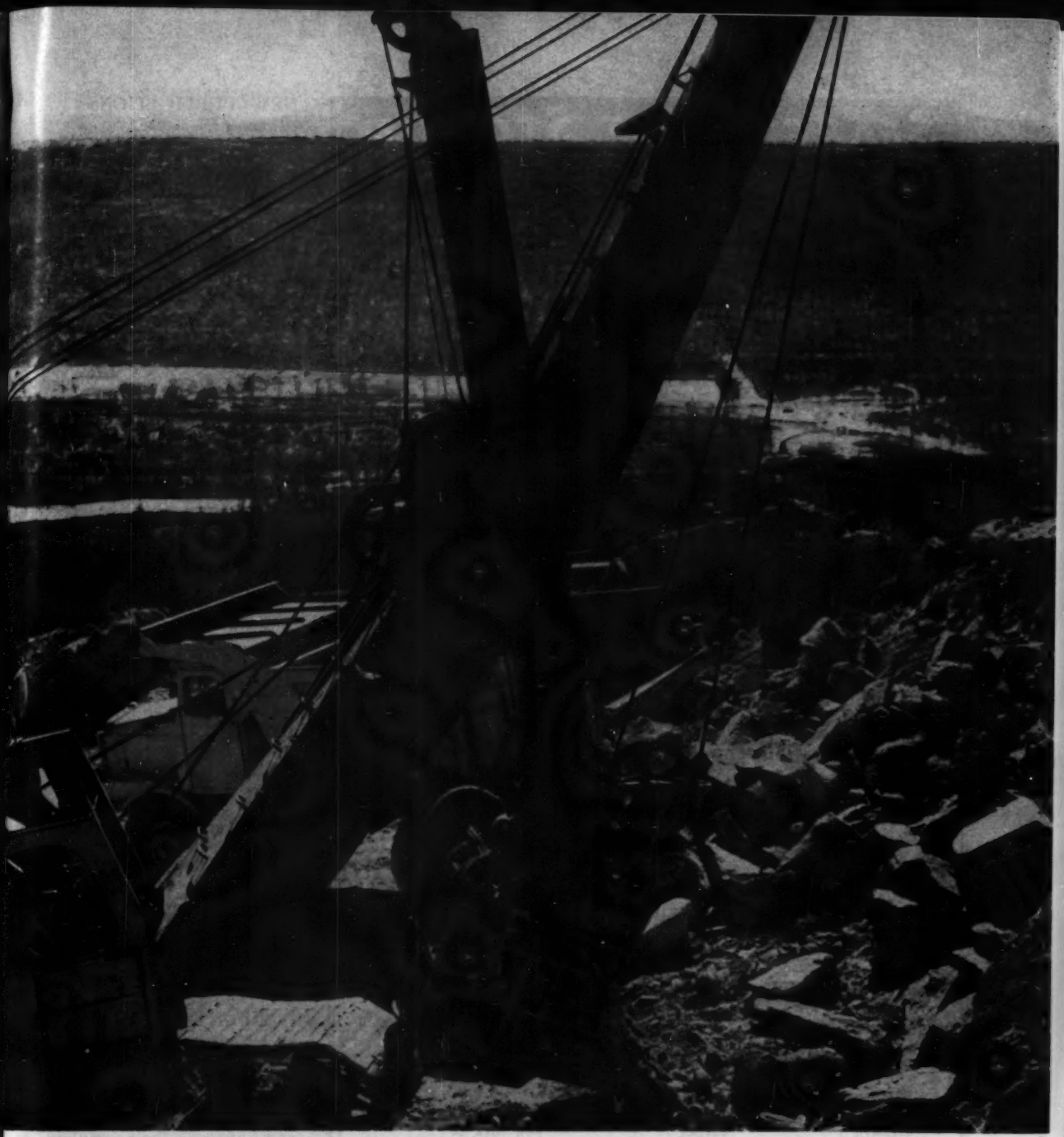

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and an electric bridge-deck finisher. — **Heltzel Steel Form and Iron Co., Warren, Ohio.**

TRACTOR CATALOG — Euclid describes its TC-12 twin-power crawler tractor in a 24-p catalog. Photographs and cutaway drawings illustrate twin-power application, Torqmatic drive, and hydraulic track tensioning. The publication contains condensed specifications, a performance chart, and data for attachments. — **Euclid Div., General Motors Corp., Cleveland, Ohio.**

LIFT CRANE—Manitowoc illustrates its new Model 4000 lift crane—described as "the world's only crawler crane with a rated capacity of 125 tons" at 17-ft radius—in a new catalog. **Manitowoc Eng. Corp., Manitowoc, Wis.**

MORTAR AND CONCRETE — Five Master Builder pamphlets discuss concrete and mortar applications. Twelve important uses of Embeco non-shrink mortar are outlined in a 4-p brochure E-38. A 24-p booklet MP-4d describes the features and method of installing Masterplate Iron-Clad floors designed for heavy industrial use. "Considerations for Concrete and Mortar" contains a complete check list of factors to be considered when specifying concrete and mortar. Approved concrete cylinder casting methods for accurate testing are outlined in bulletin RM-48. And a hot weather concreting guide (RM-67B) is suitable for posting at job sites. — **Master Builders Co., Cleveland 3, Ohio.**

HIGHWAY EQUIPMENT—A 22-p catalog by Littleford describes and illustrates their complete line of black top equipment. Included are asphalt plants, bituminous distributors, brooms, asphalt pavers, kettles, supply tanks, rollers, and accessory paving tools.—**Littleford Bros., Inc.,457 East Pearl St., Cincinnati 2, Ohio.**

EARTHMOVERS — A 24-p brochure describes the new Haulpak off-highway truck line. The catalog details design and operational features of the 27-ton and 32-ton end dumps and 80-ton bottom dump haulers. A 16-p booklet describes the 218-hp rubber-tired Tournatractor. Copies obtained

from local dealers.—**Le Tourneau-Westinghouse Co., 2301 NE Adams St., Peoria, Ill.**

CONCRETE DATA BOOK — "Concrete Mixer Application Data Book" is designed to aid in proper truck selection for ready-mix concrete. The 30-p booklet covers the various types of mixer bodies and drives, weight distribution, and truck mixer application charts for truck selection procedures. — **Ford Div., Ford Motor Co., P. O. Box 608, Dearborn, Mich.**

DUMP TRUCKS—Two booklets and one job study feature information about dump truck and trailer bodies, and hoists. Hydraulic hoists and both steel and aluminum dump bodies and trailers are described in a truck equipment catalog. Another booklet, "Let's Talk Trailers," is designed to aid in choosing correct equipment for specific on and off-highway hauling and dumping jobs. Performance features and maintenance costs provided by tandem-axle, lightweight, 26-ft, 15-yd capacity frame-type trailers are described in a job study folder. — **Galion Allsteel Body Company, Galion, Ohio.**

WELDING DATA—Five different firms have published booklets about welding. 1. A 4-p folder describes the Amsco portable, semi-automatic welder for build-up and hardfacing. 2. A new bulletin describes operating features, construction details and applications for a new line of Lincoln Idealarc welding machines. 3. A manual describes in detail the use of welding carbon products, rods, plate, and paste that eliminates the need for jigs and fixtures on many small jobs. 4. A 12-p catalog illustrates Tweco's line of cable connections and accessories. 5. Reprints of an article entitled "Which Welding Power Source Should You Use" offers a guide to the proper selection of arc welders for use in various welding processes. — **1. American Manganese Steel Div., 389 E. 14 St., Chicago Heights, Ill.; 2. Lincoln Electric Co., Cleveland 17, Ohio; 3. Arcair Co., Box 431, Lancaster, Ohio; 4. Tweco Products, Inc., P. O. Box 666, Wichita, Kan.; 5. Air Reduction Co., Inc., 150 E. 42 St., New York 17, N.Y.**

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Construction Plant

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The construction of Warragamba Dam, containing 1,600,000 cu. yds. of concrete, is approaching completion. The Special Plant used for excavation, winning, processing, transporting, storage and delivery of concrete aggregates, and batching, mixing, placing and cooling of the concrete will become progressively available for sale over the next two years, and will be offered for purchase by Public Tender. An illustrated brochure will be forwarded upon request to prospective buyers.

Public Tender Documents which are expected to be available for issue of items 1, 2 and 5 on 2nd November, 1959, and for items 3, 4 and 6-9 on 3rd February, 1960, will be forwarded on request. Tenders will remain open for 3 months and are to be enclosed in envelopes endorsed "Warragamba Dam Plant Item No. —" and addressed to the Secretary, M.W.S. & D. Board, 341 Pitt Street, Sydney.

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ITEM 2.
BI-CABLE AERIAL ROPEWAY — 150 tons per hour capacity, length 12.3 miles, automatic loading and unloading stations, 4 driving stations, 2 angle stations, 7 other cable track divide stations, 200 steel support trestles, 10 road crossing protection bridges, 600 carriages and buckets of 31 cu. ft. capacity. (Available approx. February, 1960.)

ITEM 3.
TWO 18-TON CAPACITY ELECTRIC CABLEWAYS — One fixed steel head tower and two travelling steel tail towers. Cable spans 1640 and 1795 ft. Outstanding features include "Ward-Leonard" drives providing regeneration of power, rheostatic speed controls and comprehensive safety devices. (Available not before early 1961.)

ITEM 4.
ONE 10-TON ELECTRIC CABLEWAY — Travelling head tower and fixed tail tower, cable span 1033 ft. Features are rheostatic speed control and dynamic braking. (Available not before September, 1960.)

ITEM 5.
CRUSHED ICE PLANT — Capacity 160 tons per day of clear ice; 3 "Vogt" tube-ice machines, 4 condensers and 5 "Budge" Compressors. (Available approx. March, 1960.)

ITEM 6.
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ITEM 7.
AUTOMATIC CONCRETE BATCHING AND MIXING PLANT — Capacity 150 cu. yds. hour; steel tower, bins, 9 "Johnson" automatic weigh batchers and 4/2 cu. yds. tilting drum "Koehring" Mixers. (Available not before June, 1960.)

ITEM 8.
PNEUMATIC BULK CEMENT HANDLING AND STORAGE PLANT — Two "Fuller Kenyon" Cement Pumps (45 tons/hour each); 2 Silos and 2 Bins (total capacity 2,000 tons) and approx. 20 Transport Hoppers (3 tons each). (Available not before September, 1960.)

ITEM 9.
CONCRETE HANDLING EQUIPMENT — "Planet" diesel locomotive; 6 rail trucks and 11 "Johnson" double clam shell, air-operated concrete buckets of 8 and 4 cu. yd. capacity. (Available not before June, 1960.)

A. R. STAFFORD, Secretary, M.W.S. & D. Board, 341 Pitt Street, Sydney, N.S.W., Australia.

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Methods Memo...

'Quake-Shaken Highway

This is what a severe earthquake last month did to U. S. Highway 191 near West Yellowstone, Mont. The road is plainly all shook up.

The series of shocks registered a maximum intensity on the University of California Richter scale of 7.8. That's uncomfortably close to the 8.25 recorded in San Francisco's disastrous 1906 earthquake.

Hebgen Dam on the Madison River in southwestern Montana, a rolled earthfill embankment with a concrete core wall, also suffered some damage. There are some minor leaks and cracks at the crest of the core wall of as much as 1½ in.

More serious is the danger from a slide of 5,000-000 cu yd of material that is blocking the river below the dam. This might build up a head large enough to pose a serious threat to areas downstream. The Corps of Engineers is bringing in heavy earth-moving equipment to cut away this material blocking the flow of the river.

How About This?

In February, 1958, the AFL-CIO Building and Construction Trades Department adopted a policy statement that said:

"There shall be no limit on the production of workmen or restriction on the full use of proper tools or equipment . . . Slowdowns, forcing of overtime, spread work tactics, standby crews, and featherbedding practices have been and are condemned."

A few weeks ago, Local 38 of the San Francisco Plumbers and the Associated Plumbing Contractors Association signed an agreement providing wage increases of $1.05 over the next three years and containing these provisions:

- No foreman or subforeman will work with the tools of the trade.
- Any job exceeding eight hours, when there are two or more men, must have a subforeman. Ten or more men require a foreman and a subforeman, and there must be an additional subforeman for every five men.
- If a worker is dispatched to a job, he will receive at least four hours pay; if he works more than four hours, he will receive eight hours pay.
- Whenever there are five men on a job, one of them must be at least 55 years old, if any men of that age are available.
- If a worker is dispatched as a plumber, he cannot do the work of a steamfitter (and vice versa). There must be separate foremen for plumbers and steamfitters.

Overseas Training

Construction executives with overseas assignments should investigate a new training program at the American University in Washington, D. C.

It's a six weeks course for executives and their wives designed to help them understand the business and social customs and problems of the country in which they will work. The objective is to enable Americans to work more effectively abroad and, at the same time, build good will for the U. S.

Sponsor is the Business Council for International Understanding, an organization of 70 large American firms with international interests. The State Department and other federal agencies will cooperate actively. For additional information write John Habberton, managing director, BCIU, 660 First Ave., New York 16, N. Y.

Safety Meeting

If you are interested in making your operations more efficient, at the same time saving money, plan now to attend the Construction Section meetings of the National Safety Congress Oct. 19-21 in Chicago.

Featured addresses include "The Problems and Pitfalls of Overseas Construction," by George F. Ferris, president of Raymond International, Inc; "Corporations Are Characters," by Ralph W. Olmstead, president of H. K. Ferguson Co.; and "New Era in Highway Construction" by Ellis L. Armstrong Commissioner of the Bureau of Public Roads.

Other sessions will deal with evaluation of construction machinery, designing for safety, and proper signs and markings for highway construction projects.

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EIMCO 123

FRONT END LOADER! CHECK THE

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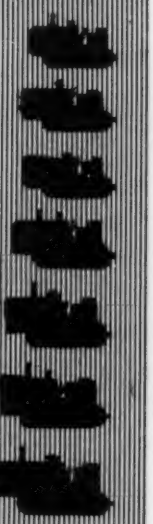
NOT THE CLAIMS

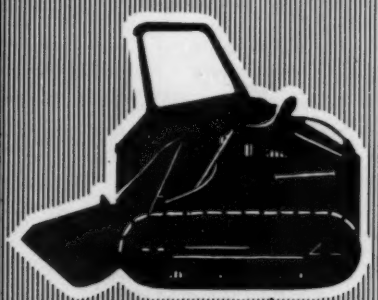
	EIMCO 103	CAT D-4	CAT D-6	AC HD-6	AC HD-11	INT. TD-9	INT. TD-15	CASE 1000
Maximum Drawbar Pull, Pounds (zero track slippage)	33,600	19,700	19,000	15,485	21,900	13,340	23,700	24,000
Torque Converter	Yes	No	No	No	No	No	No	Yes
Master Clutch	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Power shift transmission on all speeds, with oil-cooled metallic clutches that never need adjustment	Yes	No	No	No	No	No	No	No
Independently reversible track	Yes	No	No	No	No	No	No	Yes
Hydraulic track take-up	Yes	No	No	No	No	No	No	Yes
Heat-treated alloy steel grouser shoes, keyed to the track links	Yes	No	No	No	No	No	No	No
One-piece heat-treated alloy steel track rollers, tapered roller bearings	Yes	No	No	No	No	No	No	No
Equalizer bar of heavy duty heat-treated alloy steel, allowing full oscillation of crawler treads with all attachments	Yes	No	No	No	No	No	No	No
Constantly running power take-off drives, front and rear, to standard SAE specs, with rear take-off not affected by track operation, and independent hydraulic pump drive allowing simultaneous use of hydraulic, winch and blade accessories	Yes	No	No	No	No	No	No	No
Front operator's seat for full visibility	Yes	No	No	No	No	No	No	No
Ability to operate forward and backward on up to 90% slopes	Yes	No	No	No	No	No	No	No
Tractor guaranteed for one full year of single shift service	Yes	No	No	No	No	No	No	No



FOR PROOF OF EIMCO 123 SUPERIORITY

FRONT END LOADERS	EIMCO 123	CAT 955	CAT 977	AC HD6O	AC HD11G	INT. 9K3	INT. 15K3	CASE 1000
WEIGHT, POUNDS	25,000	22,470	34,915	19,600	32,000	19,985	33,235	21,800
ROCK BUCKET, CU. YARDS	1¾	1.1	1.8	1½	2¼	1½	2¼	N.A
ENGINE HP	100	70	100	72	111	71	115	100
TRACK GAUGE, INCHES	60	60	74	60	74	60	74	60
SHOE WIDTH, INCHES	17	12	18	12	16	15	18	16
LENGTH OF TRACK, INCHES	88	81½	105⅝	83⅝	106¾	75	98½	79
TRACK AREA, SQ. INCHES	3,000	2,450	3,814	2,100	3,410	2,230	3,546	2,530
GROUND PRESSURE, PSI	8.3	9.2	9.2	9.0	9.4	8.9	9.4	8.6
LIFT HEIGHT TO HINGE PIN, INCHES	144	128	144	130	139	125	144	134
DUMP HEIGHT, INCHES	115	100	114	96	114	102	113	101
DUMP REACH, INCHES	44	36½	39	31	37	36	37	40
MAX. DUMP ANGLE, DEGREES	63	50	50	43	52	60	52	50
MAX. PUMP PRESSURE, PSI	1,200	1,450	1,450	1,000	1,300	1,500	1,750	1,450
PUMP, GPM	75	43	52.5	39	72	N.A	N.A	58
LIFT TIME, SEC.	7.5	7.0	9.1	9.0	9.0	7.7	9.0	7.5
DUMP TIME, SEC.	3.0	4.0	5.0	4.0	4.0	N.A	N.A	1.4
GROUND CLEARANCE, INCHES	17	13⅝	19¼	11⅜	15⅜	9	16	16

N.A. — not available



Information is from manufacturer's data and other sources believed to be reliable, but cannot be guaranteed.

IT'S A FACT . . . not a claim . . . that here is a MODERN line of tractors that makes all other crawler-tractors old-fashioned!

Other exclusive features includes Unitized "Stress Flow" Construction, for far greater strength and rigidity; Self-cleaning Air Cleaner that completely eliminates ordinary routine cleaner maintenance and others, far too numerous to list here. Write for details and specifications on all the advanced engineering features of the modern Eimco 103 line of crawler tractors.

AVAILABLE IN FOLLOWING MODELS:

103 — TRACTOR AND DOZER
123 — FRONT END LOADER
133 — STEEL MILL FEL
143 — LOG LOADER

THE EIMCO CORPORATION

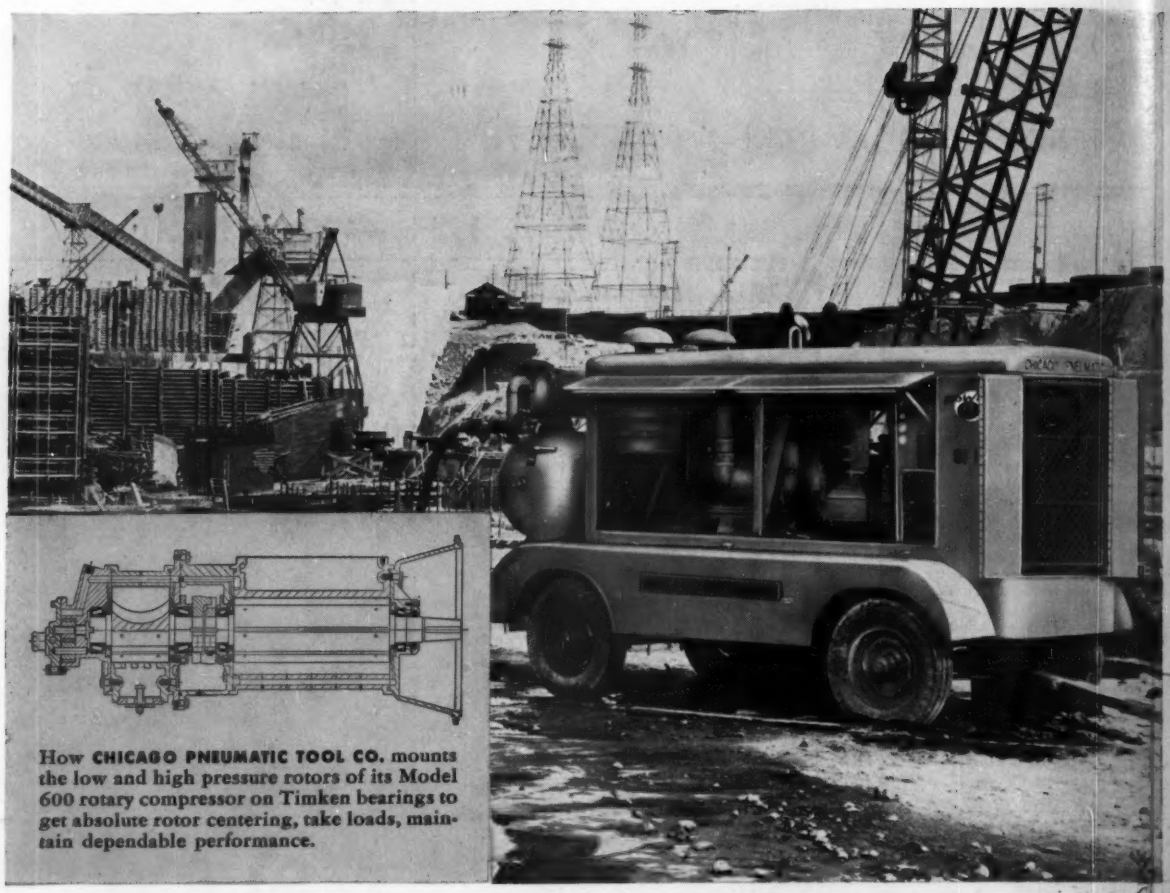
EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.

EIMCO

TRACTOR LOADER DIVISION

634 SOUTH 4TH WEST
SALT LAKE CITY, UTAH — U.S.A.

B - 454



How **CHICAGO PNEUMATIC TOOL CO.** mounts the low and high pressure rotors of its Model 600 rotary compressor on Timken bearings to get absolute rotor centering, take loads, maintain dependable performance.

Today contractors get dependable air power—compressor gets perfect rotor centering with TIMKEN® bearings

CHICAGO Pneumatic Rotary Compressors prove themselves to be real workhorses when "killing" construction jobs demand around-the-clock performance with no room for failure. One of the reasons for their success is that Timken® tapered roller bearings keep them rolling.

Each cylinder of these two-stage compressors contains a high-speed rotor that must be perfectly centered between its end plates, and end plate clearances are close. Timken roller bearings prevent any axial movement, yet take radial and thrust loads in any combination.

Timken bearings virtually eliminate friction. They're geometrically designed to have true rolling motion, and precision-made to live up to their design. They make closures more effective, too. Dirt, dust and moisture can't get in; lubricant can't get out. Maintenance is further reduced.

So to get your No.1 bearing value, specify bearings trade-marked "TIMKEN". They make any machine better, because Better-ness rolls on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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BETTER-NESS rolls on

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